

UNITED STATES GYPSUM
THE GREATEST NAME IN BUILDING



Gypsum
Drywall
Construction
4th edition Handbook



UNITED STATES GYPSUM COMPANY

Gypsum Drywall Construction

4th edition Handbook

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... ABOUT THIS HANDBOOK

This Handbook of Gypsum Drywall Construction presents complete data on products and systems developed to simplify and speed construction, enhance appearance, and increase the use of gypsum drywall construction. It contains new data on partition, ceiling and fireproofing systems, and revised up-to-date information on tools, products, methods of installation and good construction practices. It is a complete and authoritative guide, valuable for both those with limited knowledge and those with broad experience in gypsum drywall construction.

HOW IT SERVES YOU

This handbook will serve as a quick and comprehensive reference for any drywall information you want:

Architects and Builders—Complete information on drywall systems, including descriptions, advantages, limitations and detail drawings.

Contractors and Dealers—Full data on all aspects of drywall products, tools, methods, including estimating and planning.

Applicators, experienced or beginners—Clear, concise illustrated instructions on all phases of drywall application from framing to finish.

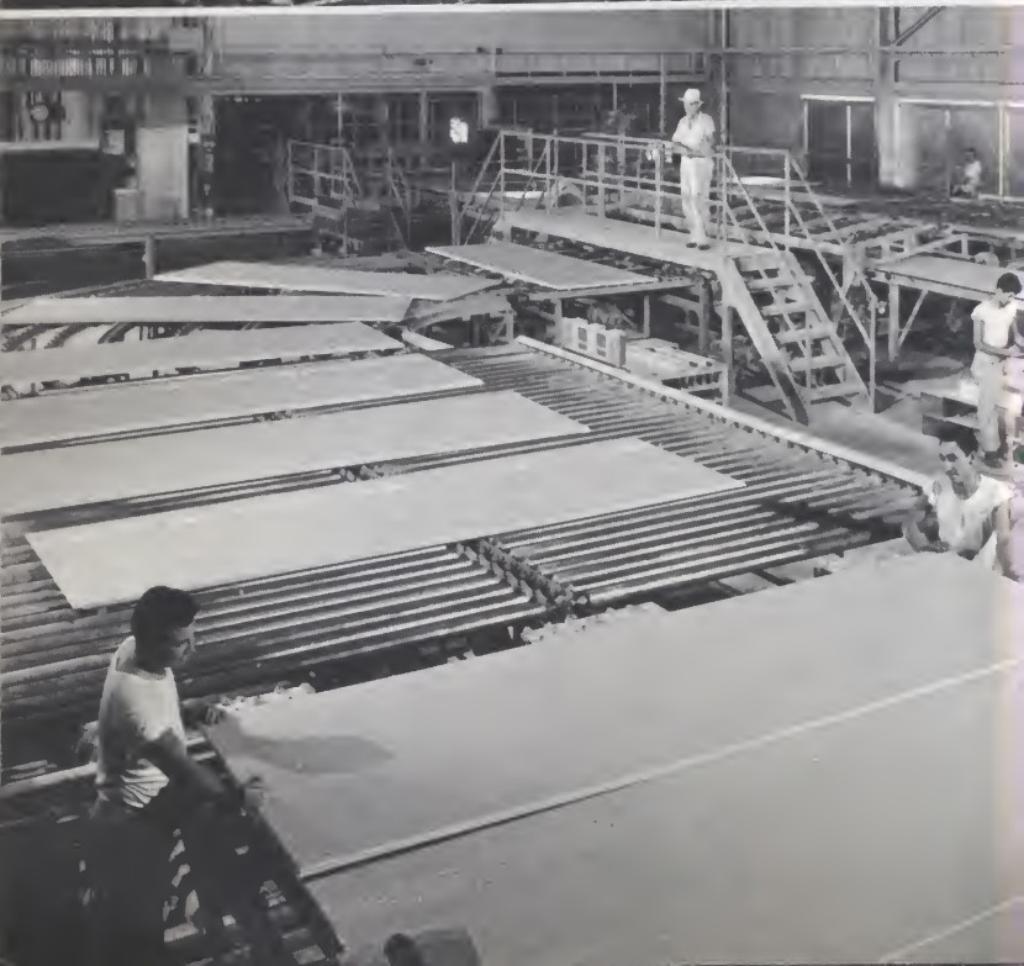
TO FIND THE INFORMATION YOU WANT:

Use the fully cross-referenced index at the back. Or—check Table of Contents on page 5 to find the applicable chapter, then use the detailed table on the first page of that chapter to find the right page.

For example, if you want information on metal trim, it's in the index both as "Metal trim" and "Trim, metal." Also, the facing Table of Contents shows "Products" as Chapter 2 and the table of contents on page 21 shows metal accessories to begin on page 32.

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CHAPTER

1

THE DRYWALL REVOLUTION

In the last decade, gypsum drywall construction has revolutionized the building industry. A dynamic expansion is taking place —to the point that today more than 75% of all new residential buildings have sturdy, beautiful walls and ceilings of fire-resistant gypsum wallboard.

In the last five years, through leadership in research and development, United States Gypsum has introduced many new products and systems for drywall construction. These systems offer specialized sound control and fire resistance together with speed of installation, strength and low cost. Their wide acceptance in commercial, industrial and institutional construction follows the same pattern of drywall's dominance in residential work.

The key product in this revolution is **SHEETROCK***, the first and most widely used brand of gypsum wallboard, now available in various types to meet every wall and ceiling requirement.

SHEETROCK has its beginning in the ground as a gray to white-colored rock called gypsum. The basic ingredient of fireproof wallboards, gypsum is a non-metallic mineral composed of calcium sulphate chemically combined with water of crystallization. This "dry" water makes up approximately 20% of the weight of gypsum rock. It is this feature which gives gypsum its fire-resistive qualities and makes it so adaptable to the manufacture of wallboard.

After gypsum ore is mined or quarried (illustrated, Page 6), it is crushed, dried, ground to flour fineness, and heated or calcined to drive off the greater part of the chemically combined water as steam. This calcined gypsum, or plaster of Paris, is then mixed with water and other ingredients and sandwiched between two sheets of specially treated paper to form a ribbon of **SHEETROCK**, as illustrated on Page 6. After the gypsum core has set, the wallboard is cut to length, dried, pre-finished as required and packaged for shipment. The entire process is conducted in strict accordance with specifications to meet carefully controlled high quality standards.

Success and continued expansion in gypsum drywall construction depends on keeping standards of quality and appearance high while cutting construction time and costs to a minimum. U.S.G. has consistently been in the forefront of this effort, providing new materials to increase utility and lower cost; new systems with improved fire resistance and sound control; advisory services to promote better materials handling, market analysis and business management; specification and application information as a guide to good construction practices.

Advantages of Gypsum Drywall Construction

Fire Resistant—Gypsum will not support combustion. Gypsum when exposed to fire behaves like a cake of ice when the flame from a blow torch is applied. The ice melts on the surface in contact with the flame while the opposite side remains cool. Similarly, the surface of gypsum wallboard opposite the flame remains at a relatively low temperature until the gypsum core is completely calcined.

Smooth Unbroken Surfaces—PERF-A-TAPE* Joint System reinforces and conceals the joints between SHEETROCK panels and provides an uninterrupted wall or ceiling surface.

Decoration—The strong, highly calendered face paper on SHEETROCK Wallboard is suitable for any type of decorative treatment such as paint, texture or wallpaper and permits redecoration during the life of the building.

Pre-finished panels are available which require no painting or joint finishing. Walls are complete as soon as panels are installed. These fire-resistant panels have a durable finish that is easily maintained.

Minimum Moisture—SHEETROCK Gypsum Wallboard eliminates the use of tons of water on the job. Since excess moisture is not put into the building, the possibility of moisture damage is minimized.

Crack Resistance—Bonded together by PERF-A-TAPE Joint System, SHEETROCK panels form walls and ceilings that are exceptionally resistant to cracks caused by minor structural movement, vibrations or settlement.

Uniform Quality—SHEETROCK Gypsum Wallboard panels are factory-made products. The raw materials and the manufacture are carefully controlled.

Speed of Erection—The use of SHEETROCK Gypsum Wallboard permits earlier completion of construction—and earlier building occupancy.

Snug-Fitting Trim—The uniform thickness of each panel permits installation of wood or metal trim snug to wall surfaces.

Warp-Resistance—Expansion or contraction of SHEETROCK under normal temperature and humidity changes and resulting deformation are negligible.

*T.M. Reg. U.S. Pat. Off.

Good Construction Practices

Two ingredients are required for a *quality drywall job*—quality products and skilled craftsmen correctly employing good construction practices. SHEETROCK Gypsum Wallboard, the PERF-A-TAPE Joint System and drywall accessories are top quality products designed to *work together*, job-proven and constantly improved. But without proper planning and correct installation by the applicator, the products by themselves cannot be expected to produce the desired quality results.

This section deals with the basic recommendations that should be followed in planning and completing the best possible job. These good construction practices can give the applicator greater profit through fewer callbacks, less waste and lower job costs, and quality results that produce quicker sales, higher prestige and an enduring business reputation.

Framing Requirements

The framing that will receive SHEETROCK Wallboard should be thoroughly inspected to be certain that all previous work has been completed in good order. Good framing is essential regardless of the type of wall surfacing materials used.

Minimum requirements for wood framing include the following:

1. Framework must meet minimum requirements of F.H.A., V.A. and/or local building code regulations.
2. Framing and bridging members must be adequate to carry the design and code loading requirements.
3. Lumber must be of the proper grade for the intended use, and 2"x4" nominal size or larger must bear the grade mark of a recognized inspection agency using grading rules recommended by the American Lumber Standards Committee.



Although the moisture content of grade marked lumber is low enough for most framing uses, it may exceed 15% which is the maximum recommended for gypsum wallboard application. At the time of wallboard application the moisture content should be as close as practical to the amounts recommended in the U.S. Department of Agriculture publication, Wood Handbook No. 72; 7% to 12% for dry Southwestern areas and 9% to 14% for the remainder of the United States. If the framing moisture content exceeds 15%, delay the wallboard application until the requirement is met. Drying can be speeded by heating the building to 55° to 70°F. and providing ventilation.

4. Framing lumber should be straight, true, and of uniform dimension.
5. Extremely soft framing members should not be used for attachment of gypsum wallboard.
6. Studs, plates, joists and headers should be checked for accurate spacing and alignment (illustrated, left). Spacing of framing should not exceed the maximum allowable for the thickness of SHEETROCK to be used. If framing is out of alignment, the surface of the wallboard applied to it will be correspondingly out of plane.
7. Horizontal load bearing members should be of sufficient dimension, and trusses should be fabricated in such a manner that when the full design load is applied the deflection should not exceed 1/360 of their span.
8. Studs or back-up members should be provided at all interior corners for both support and end or edge nailing of SHEETROCK Wallboard. Nails may be omitted when Floating Interior Angle attachment is used (see page 75 for details).
9. All joists must be level and correctly bridged in spans over 6'. Bridging should be securely nailed and should not extend below the bottom of the joists.
10. Exterior door and window openings should be properly framed with double studs and headers.
11. If joists, rafters or trusses do not fall directly over studs, top plate must be of sufficient dimension to transfer the load from these members to the studs. Single plate may be used in non-load bearing partitions.
12. Adequate headers should be provided to support fixtures such as sinks, cabinets, towel rods, soap dishes, etc.
13. Frames at all openings in gypsum wallboard surfaces should be set for thickness of wallboard to be used.
14. Electrical outlets, switch boxes, all concealed heating ducts and rough plumbing work should be set to receive the thickness of the SHEETROCK Wallboard to be used on the job so that none will cause the board to be held away from the framing. Rough plumbing work and heating ducts should be tested before SHEETROCK application.

FRAMING CORRECTIONS

If joists are out of alignment, 2"x6" leveling plates attached perpendicular to and across top of ceiling joists may be used. Toe nailing into joists pulls framing into true horizontal alignment and insures a smooth level ceiling construction.

Bowed or warped studs may be straightened by sawing the hollow sides at the middle of the bow and driving a wedge into the saw kerf until the stud is in line. Reinforcement of the stud is accomplished by securely nailing 1"x4" wood strips or "scabs" on each side of the cut (see photo).



Job Storage

If possible, **SHEETROCK** Wallboard should be ordered for delivery a day in advance of drywall application. Materials stored on the job for a long period of time are subject to excessive abuse. Wallboard, like millwork, is a finish material to be handled with care to avoid damage.

The **SHEETROCK** should be placed inside under cover and stacked flat on a clean floor in the centers of the largest rooms. It is often desirable to place the necessary number of pieces of **SHEETROCK** Wallboard in the location where they will be used. All materials used on the job should remain in their wrappings or containers until ready for actual use.

SHEETROCK planned for use on ceilings should be placed on top of pile for removal first. Avoid stacking long lengths on short lengths, as the weight of overhang of the longer board is apt to break the boards.

If flat storage space is not available an alternate method of short-term, on-the-job storage is placing the wallboard vertically against the framing with the long edge of the board horizontal. This method should not be used for long periods since vertical storage may deform the board. With this type of storage, some jobs cannot be stocked until electrical and plumbing installations are made.

Caution should be exercised not to overload the framing members acting as a brace for this manner of storage, and not to overload floor space in a storage area when board is piled flat. There are so many variable conditions that, in general, outside storage of **SHEETROCK** Wallboard is not recommended.



Mechanical Handling

When drywall construction moved into high-rise buildings, it brought with it the new challenge of moving large wallboard panels from the ground to the point of use many stories up. Materials handling on the job site can add cost and whittle away profit while the contractor scarcely knows where his money has gone. Time and money savings can be substantial when correct handling procedures are used. Job conditions vary so widely that it is impossible to establish universal materials handling procedures. However, there is much to be learned from inspecting methods used in various job situations and from reviewing resulting costs.

Case studies with photos and step-by-step procedures of material handling methods used by contractors around the country are found in the free booklet "Better Ways to Get Gypsum Wallboard Upstairs." This booklet, No. X-351, available from your U.S.G. representative, will help in determining on-site handling costs and methods best suited to particular job conditions.

Temperature and Humidity Conditions

In cold weather (outdoor temperatures less than 55° F.), controlled heat in the range of 55° to 70° F. must be provided. This heat must be maintained both day and night 24 hours before, during and after entire gypsum wallboard and joint treatment application and until permanent heating system is in operation or the building is occupied. Ventilation should be provided to eliminate excessive moisture. In glazed buildings, this may be accomplished by keeping windows open approximately 2" top and bottom (or side-pivoted windows approximately 4") to provide air circulation. In enclosed areas lacking in natural ventilation, temporary circulators should be used. Under slow drying conditions, allow additional drying time between coats of joint compound. Avoid drafts during hot, dry weather to prevent too rapid drying of joint compound. Also see "Cold Weather Tips —PERF-A-TAPE Joint System Application," page 97.

General Recommendations for Applying SHEETROCK Wallboard

- Ceiling panels should be installed first.
- SHEETROCK Wallboard panels should be cut so as to slip easily into place.
- All joints should be loosely butted together. Boards should never be forced into position.
- Tapered edges, except at angles, should always be placed next to one another.
- Butt ends should never be placed next to a tapered edge. (SHEETROCK Wallboard is tapered and wrapped along the long dimension to facilitate joint treatment. Exposed ends (butts) along the short dimension are not tapered.) Wherever possible, SHEETROCK should be applied horizontally and in lengths to span ceilings and walls without end (butt) joints. If butt joints occur, they should be staggered and located as far from the center of walls and ceilings as possible.
- All ends and edges of SHEETROCK Wallboard must be supported on framing members, except face layer of Double Layer application and where end joints are to be back-blocked and floated. For description of Back-Blocking see page 76.
- If metal trim is to be installed around edges, doors, or windows, determine if trim is to be installed on framing prior to application of wallboard. Refer to Chapter 2 for description of products and to Chapter 3 for description of installations.

Measuring—All measurements must be accurate. They should be taken at approximate wall location of each edge or end of the board, whichever the case may be. Two measurements should be made as a check, one on the other. In addition, this procedure will usually warn applicator of partitions or door frames that are out of plumb so that allowances in cutting may be made. A 12-foot steel tape rule is recommended. All tools for measuring and cutting are illustrated and described in detail in Chapter 7—Tools.

Cutting—Straight line cuts across full width or length of board are made by scoring face paper, snapping core of board, and then cutting back paper. The common tool used to score and cut gypsum wallboard is a Stanley wallboard trimming knife. Regardless of type used, blade should always be kept sharp so that score will be made through paper into core of gypsum wallboard.

Use of a straight edge is recommended. An aluminum 4-foot T-square, ruled on both sides, facilitates clean, straight cuts.



Score paper on face of board with cutting knife, using a straight edge as a guide.



Break the gypsum core of SHEETROCK by snapping and bending away from the scored paper side. Complete cutting by running knife through back paper from above or below.



Smooth cut edges with a rasp, coarse sandpaper or metal lath wrapped around a block of wood, or trim with a cutting knife.



Fastening—**SHEETROCK** Wallboard is fastened to wood framing with either nails or screws. Traditionally, nails have been the sole fastening means for wallboard constructions, but use of the USG Drywall Screw—Type W is the best known insurance against fastener pops caused by loosely attached board. 1½" USG Drywall Screws—Type W are applied with a positive-clutch electric power-driven screwdriver equipped with an adjustable screw depth control head and a Phillips bit.

Extensive comparison tests have shown the superiority of the screw over the GWB-54 annular ring nail, itself the most effective of nail fasteners. Compared to the nail, the screw offers:

- Over 100% greater withdrawal resistance.
- Over 100% greater "push-off" resistance.
- Reduced incidence of loose board.
- Increased coating protection against rust.
- Reduced fastener head defects, resulting in fewer call-backs.
- Tighter attachment of **SHEETROCK** Wallboard to framing.
- Fewer fasteners, less spotting and joint compound needed.
- Elimination of paper tearing and core fracturing associated with nailing.

Two alternate methods for fastening wallboard are available:

1. Double Nailing System—for minimizing defects due to loosely nailed wallboard by placing second nails within 2" of first nails.

2. Adhesive Nail-on System—A continuous bead of **SHEETROCK** Brand DWA-14 or DWA-10 Adhesive is applied to framing plus supplementary nailing; improves bond strength by 50% to 100%, greatly reduces face nailing needed.

Specifications for recommended nails and drywall screws are given in Chapter 2—Products. The spacing of fasteners is included in the description of each type of wallboard application in Chapter 3. For fastener specifications used in specific drywall systems, see Chapter 4 or consult the official test report.

General Recommendations for Joint Treatment

The growth of drywall construction in the building industry is due largely to the development of quality joint finishing. U.S.G., the originator and developer of modern joint treatment, has perfected products with overall qualities that provide the best, most uniform finished result. But satisfactory appearance and performance on interior walls and ceilings are in the hands of the applicator. The quality of his work determines how well wallboard joints are reinforced and concealed and fastener heads covered. His planning and skill will determine the quality of the finished surface.

Occasionally, during construction, problems arise which are beyond the control of the manufacturer. Nevertheless, through his experience, the manufacturer has developed improved products and methods of use to overcome recurrent problems. The drywall applicator can save time, trouble and expense by observing proper precautions and, in the event that difficulties arise, by making a complete and frank appraisal of his work. The following are precautionary measures designed to prevent problems.

Materials—Store joint treatment materials in a dry place and rotate stocks; age and dampness affect the working qualities of this material. Protect Ready-Mixed **PERF-A-TAPE** Compound from freezing.

Check Working Surfaces—Gypsum wallboard must be firmly attached to framing members without cutting the surface paper or fracturing the core of the board. Make certain each board forms a true, even alignment at each joint. Check width and depth of taper in the board.

Mixing—Use clean containers and mixing tools. Follow directions for mixing the particular joint compound shown on the package. Use clean, lukewarm (not hot) water for mixing. Add powdered compounds to the water. *Do not over-thin compound with water!*



Application—The channel formed by the tapered edges of the gypsum wallboard must be completely filled with compound level with the plane of the board. When tape is applied and wiped down be sure that sufficient compound remains beneath the tape *but not more than 1/64"* under the feather edge. A recommended procedure is to apply a skim coat of compound immediately after embedding tape. *Avoid heavy fills.* Finishing compound should not be used for embedding tape or as a first-coat application. Three-coat work is essential for quality results.

Because of its exceptional smoothness, low shrinkage and ease of sanding, Ready-Mixed Compound is the ideal material for taping and all finishing coats as well as *all* nail spotting. Good workmanship by the mechanic will provide finished jobs that require little or no sanding—the goal of all applicators.

Abnormal Drying Conditions—Allow joint compound to dry properly before applying second and third coats or decorating. In cold, damp weather all types of joint compounds will dry slowly and 24 to 48 hours is often insufficient between coats. DURABOND* Joint Compound will perform at its best under slow drying conditions because its chemical hardening principle is not affected by high humidity conditions. Cold weather difficulties are more prevalent when *improper* or *inadequate* heat is provided. The minimum heat requirements of 55° F. should be maintained at *all times* during the erection of the gypsum wallboard as well as through the taping, finishing and decorating phases. Use thermostatically controlled central heating and take particular care to maintain proper ventilation.

Applicators will recognize too rapid drying conditions when the compound takes on a shorter working life, especially along the feather edges and where one joint joins or crosses another. Rapid drying is usually due to low humidity and warm winds or over-heating in extremely cold, dry winter weather. During these periods every effort should be made to prolong the working and drying time of the compound. Stop drafts of warm, dry air by closing doors and windows. Shorten the time required to complete the application by working shorter lengths of joint at one time. Raise the humidity by liberally sprinkling sub-floor with water. *Do not thin compound with additional water.*

Care of Equipment—As with other crafts, applicators should keep tools clean and in good shape to secure maximum benefits. Mechanical taping and finishing equipment must be kept in perfect working order and all parts *must* be replaced as soon as they show the slightest sign of wear. Mechanical tools can often "read the wall" better than the applicator. Therefore, a competent mechanic with a thorough knowledge of his equipment will constantly adjust his tools to obtain higher or lower crowns required by particular surfaces on every job.

It is recommended that a conventional garden hose with nozzle be available to properly flush and clean DURABOND Joint Compound from all tools, mixing containers, bread pans and equipment before the chemical hardening action takes place. *Immersion of equipment in water will not prevent hardening of the compound.* Care of equipment is beyond our control and, therefore, United States Gypsum cannot assume any responsibility for any loss or damage to equipment.

Joint treatment product description and specifications are found in Chapter 2—application procedure in Chapter 3.

Completion of Job—After trim has been applied and before decoration, correct all surface damage and defects to leave walls and ceilings smooth and without observable blemishes which will show through decoration. Remove all debris and rubbish, excess material, equipment and scaffolding from the job and clean all surfaces as necessary to remove joint compound, adhesive droppings, etc. so the finished work will be left ready for decoration.

General Recommendations for Decorating

Quality drywall construction merits equally good decoration, and the wise applicator will recommend paints that enhance the appearance of his finished job. For smooth walls U.S.G. specifically developed SHEETROCK Sealer and TEXOLITE* Primer-Sealer to lay the nap of face paper raised by sanding. Either will give a satisfactory base coat for GRAND PRIZE* or TEXOLITE Alkyd Latex Paint and other quality interior finishes. U.S.G. also manufactures a full line of texturing materials to meet the preference of every customer. Refer to Chapter 2 for the Selector Guide to USG Paint Products.

Good practices for decorating require that:

1. All surfaces, including joint treatment compounds, must be dry, sound, clean, free of dust, grease or oil.
2. Paints should be delivered in original unopened containers and protected from damage and tampering.
3. All materials should be used according to instructions.
4. Wallboard joints and fasteners should be treated with PERF-A-TAPE Joint System in accordance with directions.

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/PRODUCTS

GYPSUM DRYWALL CONSTRUCTION

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CHAPTER

2

QUALITY PRODUCTS FOR DRYWALL CONSTRUCTION

There is only one SHEETROCK—the interior wall and ceiling surface developed and improved by United States Gypsum. It is the product which has dominated the "drywall" revolution in residential construction. Systems using SHEETROCK wallboard are fast gaining the same acceptance in commercial building.

SHEETROCK is manufactured in nine different forms for special purposes. Complementing these is the industry's broadest line of metal accessories, fasteners, adhesives, joint treatment products and paints to provide complete partition and ceiling assemblies for dozens of specific applications.

The products described and illustrated in this section are the basic materials recommended by United States Gypsum Company for gypsum drywall construction. These materials are designed to meet the essential requirements of economy, speed of installation, strength, fire resistance, and ease of decoration which are characteristic of quality drywall. U.S.G. drywall methods and materials are the result of years of experience in the field of building materials. They have been developed to achieve the optimum results based on extensive laboratory tests and job-proven performance. The United States Gypsum Company trademark is your assurance of a product of proven quality to meet your construction needs.

United States Gypsum maintains special wallboard sales representatives to consult with contractors, architects and dealers on wallboard products and systems and their application to special job problems and conditions. They may be reached through the nearest U.S.G. sales office (listed inside back cover) or by directing inquiries to United States Gypsum, Dept. 147, 101 S. Wacker Dr., Chicago, Illinois, 60606.

SHEETROCK Wallboard

DESCRIPTION

SHEETROCK is a mill-fabricated gypsum wallboard composed of a fireproof gypsum core encased in a heavy manila-finished paper on the face side and a strong liner paper on the back side. The face paper is folded around the long edges to reinforce and protect the core, and the ends are square-cut and finished smooth.

SHEETROCK Wallboard complies with Federal Specification SS-L-30b; ASTM C36.

ADVANTAGES

Interior walls and ceilings built with SHEETROCK have a durable surface suitable for any type of decorative treatment and for repeated decoration during the life of the building. The joints between adjacent boards may be reinforced and concealed with the PER-A-TAPE Joint System, or may be featured by leaving exposed or covering with a decorative moulding.

Drywall Construction—mill-fabricated boards eliminate excessive moisture in construction.

Fire Resistance—Up to 2 hours for partition and floor-ceiling constructions have been obtained. See Chapter 5 for fire resistance ratings and related construction.

Sound Control—SHEETROCK Wallboard is a vital component in partition and floor-ceiling systems having excellent sound resistive properties. See Chapter 5 for sound ratings.

Crack Resistance—Exceptionally resistant to cracks caused by minor frame movement, vibration or settlement.

Quickly and Easily Applied—keeps construction costs low.

Readily Decorated—with paint, texture, or wallpaper.

Warp Resistant—under normal atmospheric changes.

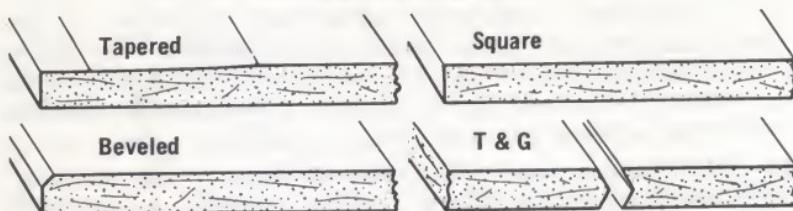
Availability—24 strategically located U.S.G. operating plants produce and/or stock the gypsum board materials described here. Seven warehouse facilities, in addition to these plants, increase the total distribution and service efficiency to major markets and rural areas from coast to coast. All standard or specialty gypsum board products may be considered readily available and easily procured upon short notice.

GENERAL LIMITATIONS

1. Not recommended where exposure to moisture is extreme or continuous.
2. Must be adequately protected against wetting when used as a base for ceramic or other wall tile (see Insulating SHEETROCK limitation). SHEETROCK W/R Wallboard is the recommended product for this purpose.
3. Maximum framing spacing: $\frac{1}{2}$ " and $\frac{5}{8}$ " SHEETROCK Wallboard is designed for framing centers from 16" to 24"; $\frac{3}{8}$ " and $\frac{1}{4}$ " SHEETROCK, on centers up to 16". When $\frac{1}{2}$ " or $\frac{5}{8}$ " SHEETROCK Wallboard is applied across framing on 24" centers and wallboard joints reinforced, headers are not required.
4. Application of SHEETROCK over $\frac{3}{4}$ " wood furring applied across framing is not recommended since the relative flexibility of the furring under impact of the hammer tends to loosen nails already driven. Furring should be 2"x2" minimum.
5. The application of SHEETROCK over an insulating blanket, that has first been installed continuously across the face of the framing members, is not recommended. Blankets should be recessed and the blanket flanges attached to sides of studs or joists.

TYPES OF SHEETROCK WALLBOARD

Types of Edges



Tapered Edge SHEETROCK has long edges tapered on the face side in order to form a shallow channel for the joint reinforcement which provides smooth, continuous wall and ceiling surfaces. Made in four thicknesses:

$\frac{5}{8}$ ", recommended for the finest single layer drywall construction. The greater thickness provides increased resistance to fire exposure and transmission of sound.

$\frac{1}{2}$ ", for single layer application in new residential construction.

$\frac{3}{8}$ ", lightweight, applied principally in the double wall system and in repair and remodel work.

$\frac{1}{4}$ ", a lightweight, low cost, utility gypsum wallboard, for use over old wall and ceiling surfaces.

Width: 4'; length: 8', 9', 10', 12' or 14' (except $\frac{1}{4}$ ", available in 8' and 10' lengths only); edges: tapered; finish: ivory manila paper, suitable for paint, wallpaper or other decoration.

SHEETROCK FIRECODE* Wallboard, made in $\frac{5}{8}$ " and $\frac{1}{2}$ " thicknesses, combines all the advantages of Regular SHEETROCK with additional resistance to fire exposure—the result of a specially formulated mineral core.

$\frac{1}{2}$ " "FIRECODE C" Wallboard makes possible fire ratings in floor-ceiling constructions previously obtained only with $\frac{5}{8}$ " gypsum wallboard. In accordance with Underwriters' Laboratories tests, certain partition, floor-ceiling, and column fireproofing constructions afford 45-minute to 3-hour fire resistance ratings. These products are used in 2-hour floor and ceiling, 2-hour wall and 2 and 3-hour column fireproofing constructions as listed by Underwriters' Laboratories (see Chapter 5).

Limitations in addition to General Limitations, page 23:(1). In order to attain fire resistance ratings, the construction of the partition and/or floor and ceiling assemblies must be in accordance with the respective Underwriters' Laboratories, Inc., panel designs. See Chapter 4-Systems, for description of panel constructions. (2) Maximum spacing of frame members: 24" c. to c.

Width: 4'; length: 8', 9', 10', 12' or 14'; edges: tapered; finish: ivory manila paper, suitable for paint, wallpaper or other decoration.



Insulating SHEETROCK Wallboard is made by laminating a sheet of bright aluminum foil on the back surface of regular SHEETROCK Wallboard. It is effective as a vapor barrier for exterior walls and ceilings when applied (1) with foil surface next to the studs in single layer application, or (2) as the base layer (with foil surface next to the studs) in the double layer system. A significant thermal insulating value is achieved when SHEETROCK is installed with the aluminum foil facing an air space of $\frac{3}{4}$ " minimum. The metal foil reduces outward heat flow in winter, and inward heat flow in summer.

Insulating SHEETROCK also provides an efficient vapor barrier which resists the passage of moisture vapor through the exterior wall and roof construction. The possibility of condensation within an exterior wall and resulting exterior paint failures is minimized. Meets ASTM requirements for a vapor permeability not exceeding 0.30 perm.

Limitation: do not use as a base for ceramic or other tile. Thickness: $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{5}{8}$ ". Sizes, edges and finish are same as for regular Tapered Edge SHEETROCK.

**Thermal resistance (R) value
Insulating SHEETROCK Wallboard (1)**

Thickness	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "
wall application	2.04	2.15	2.26
ceiling application			
summer conditions	4.89	5.00	5.11
winter conditions	1.66	1.77	1.88

(1) Including air space of $\frac{3}{4}$ " or more.

SHEETROCK Vinyl Wallboard is a new product with an unequalled range of style and color, pre-decorated and virtually maintenance-free. A rugged 8 mil vinyl film is laminated to beveled edge SHEETROCK Wallboard to provide long-lasting resistance to stains and scuffs, plus ready washability. The standard gypsum core protects against fire. Adaptable to any U.S.G. partition system, also ideal for resurfacing; beveled edges form pleasing "V" groove at joint when boards are erected; no further treatment needed.

Available in two series: **SHEETROCK Vinyl Panel Wallboard**, in choice of 9 stocked colors, embossed with slight texture pattern; **SHEETROCK Custom Vinyl Wallboard**, in choice of 122 designer-selected colors and six different patterns, on minimum order only.

Thickness: $\frac{1}{2}$ "; width: 4'; length: 8', 9' or 10'. Matching colored nails available.

ULTRAWALL* Panels are also pre-decorated, in V-groove, random plank patterns to simulate fine wood paneling. The finish may be treated with USG Plastic Glaze (clear) when additional protection is desired. Matching colored nails are used for inconspicuous nailing; molding available in matching patterns (see page 36).

Thickness: $\frac{3}{8}$ "; width: 4'; length: 7', 8', 9' or 10'; edges: square; finish: Ranch Pine (shown below), Club Walnut, Orchard Cherry, Java Teak and Scandia.



ULTRAWALL Colorcast Panels are pre-decorated with a durable coated paper in a choice of three solid pastel colors. The surface durability is comparable to one coat of semi-gloss paint. Matching colored nails are used for inconspicuous nailing; matching moldings available (see page 36).

Thickness: $\frac{3}{8}$ "; width: 4'; length: 7', 8', 9' and 10'; edges: beveled; finish: Shasta White, Sahara Tan and Gulf Green.

SHEETROCK W/R Gypsum Wallboard is a water-resistant gypsum wallboard that provides an excellent base for the adhesive application of ceramic, metal, and plastic tile. It is water-resistant all the way through: (1) multi-layered face and back paper is chemically treated to combat penetration of moisture; (2) the gypsum core is made water-resistant with a special asphalt composition. It was developed for application in bathrooms, powder rooms, kitchens, utility rooms, and other high-moisture areas. SHEETROCK W/R Gypsum Wallboard is easily recognized because of its distinctive green face.

In addition to its use as a superior tile base in new construction, SHEETROCK W/R Wallboard is a cost-saver in modernization work. It permits new tilework to be installed over existing surfaces without tearing out old walls.

Limitations: adherence to recommendations concerning sealing exposed edges, painting, tile adhesives, framing and installation is necessary for satisfactory performance (see Chapter 3, page 83). Not recommended for use as an exterior soffit or in other exterior areas subjected to sustained high humidity and moisture conditions.

Thickness: $\frac{1}{2}$ " and $\frac{5}{8}$ "; width: 4'; length: 8' or 12'; edges: tapered; finish: green treated face paper, suitable for receiving tile, paint or wallpaper.

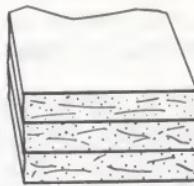
SHEETROCK Brand W/R Sealant is applied to all raw cut edges and nail heads of special SHEETROCK Water-Resistant Gypsum Wallboard used in high-moisture room areas—thus protecting the gypsum core from moisture penetration. Packaged: 24 pts. per ctn.; ctn. weight: 30 lbs.

1" USG* Coreboard is a solid gypsum board product fabricated for use with the USG Solid, Double Solid, Triple Solid and Semi-Solid Partitions (see Chapter 4 for construction details). Additional layers of gypsum board are generally laminated to the coreboard to provide the completed wall assembly. When used in conjunction with the 2" Solid, Double and Triple Solid Partitions, coreboard is manufactured with an integrally formed "V" T & G edge. USG Coreboard, as used with semi-solid partitions, is available in 1"x24" panels prescored either 6" or 8" o.c. Coreboard strips are then easily snapped and separated from this master unit. Thickness: 1"; width: 24"; edges: "V" T & G or square; length: 8', 9', 10' and 12' (prescored—7'8" lengths only); finish: gray paper, not suitable as an exposed surface. See table page 28.

Type Edge	Square Edge			"V" T & G Edge
Coreboard	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{1}{2}$ "
Size	2' & 4' x 8' 4' x 12'	2' & 4' x 8' 4' x 12'	4' x 8'	2' x 8'



gypsum rib
1" x 6"



gypsum stud
 $1\frac{5}{8}$ " x 6"

USG Gypsum Studs and Ribs are made in two thicknesses and stock lengths to serve as non-load bearing internal members of four USG Studwall and Ribwall partition systems. The $1\frac{5}{8}$ "x6" Gypsum Stud is factory-laminated from one layer $\frac{5}{8}$ " SHEETROCK Gypsum Wallboard sandwiched between two layers of $\frac{1}{2}$ " SHEETROCK, and is used in the USG Studwall #258 and #278 partition (see Chapter 4) as well as in the USG Ribwall #368 partition. The 1"x6" Gypsum Rib is snapped and separated on the job from stock lengths of 1"x24" USG Coreboard prescored 6" o.c., and is used in the USG Ribwall #418 drywall partition. USG Laminating Adhesive or PERF-A-TAPE Joint Compound (embedding type) is used in laminating studs and ribs to base layer or face panels.

BAXBORD* **Gypsum Backing Board** is a low cost, easy-to-handle gypsum board encased on both sides with strong gray paper, made in three thicknesses:

$\frac{3}{8}$ " BAXBORD, for use as a base for the job-laminated Double Layer SHEETROCK Wallboard system, and the USG Metal Stud partition system. It may also be used as a base for acoustical tile when applied perpendicular to wood joists spaced not over 16" o.c.

$\frac{1}{2}$ " BAXBORD, the recommended base for adhesively or mechanically applied acoustical tile. It may be screw applied to the USG Drywall Furring Channel; nailed to metal furring members or nailable steel joists; or nailed to wood framing.

$\frac{5}{8}$ " BAXBORD FIRECODE, for use as a base for adhesive or mechanical application of acoustical tile in one-hour fire-rated systems. "V" tongue and groove edges minimize air and dirt infiltration.

Limitations: (1) In order to attain fire resistance ratings with $\frac{5}{8}$ " BAXBORD FIRECODE backing board, the construction must be

in accordance with the floor or roof and ceiling design listed by Underwriters' Laboratories, Inc. (see Chapter 5). (2) Where $\frac{1}{2}$ " or $\frac{5}{8}$ " BAXBORD is to be used as acoustical tile base, store acoustical tile and base in a dry area protected from the elements. Provide flat, solid support during storage. Take necessary precautions to prevent condensation in the storage area and within the structure in which the acoustical base is applied.

Finish: gray paper, not suitable as an exposed surface.

Insulating BAXBORD Gypsum Backing Board is made in the same three thicknesses as standard BAXBORD, but with aluminum foil laminated to the back surface. It functions as a vapor barrier and as thermal insulation in the same manner as Insulating SHEETROCK Wallboard. Widths, edges and face side finish are identical with standard BAXBORD (above); length: 8'.

Table I. SHEETROCK Wallboard Specifications

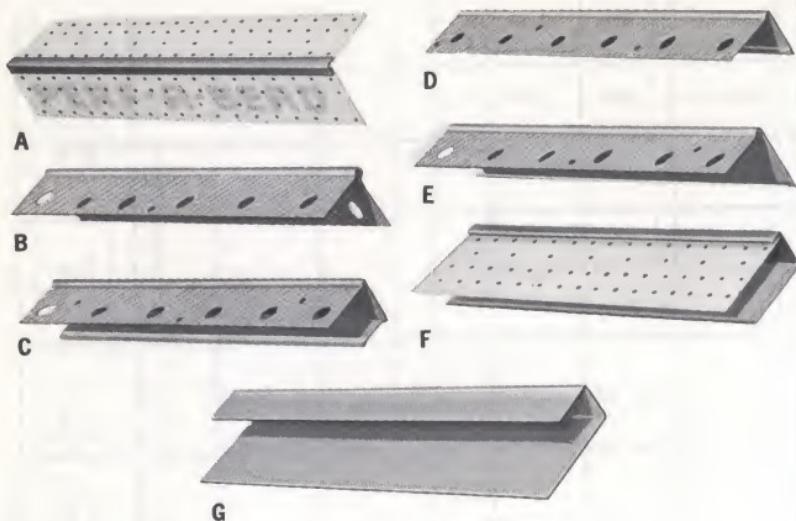
Thickness	Type	Edge	Width	Approx. Weight Lbs. per MSF
$\frac{5}{8}$ "	FIRECODE	Tapered	48"	2,600
	Regular	Tapered	48"	2,600
	Insulating	Tapered	48"	2,600
	FIRECODE Insulating	Tapered	48"	2,600
$\frac{1}{2}$ "	FIRECODE	Tapered	48"	2,025
	FIRECODE "C"	Tapered	48"	1,975
	Regular	Tapered, Square or Beveled	48"	2,025
	Insulating	Tapered	48"	2,070
	FIRECODE Insulating	Tapered	48"	2,070
	Vinyl Panel W/R	Beveled	48"	2,100
		Tapered	48"	2,025
$\frac{3}{8}$ "	Regular	Tapered, Square or Beveled	48"	1,526
	Insulating	Tapered	48"	1,556
	ULTRAWALL	Beveled	48"	1,556
$\frac{1}{4}$ "	Regular	Tapered	48"	1,097

Table II. Backing Board Specifications

Thickness	Type	Edge	Width	Length	Approx. Weight Lbs. per MSF
$\frac{5}{8}$ "	BAXBORD FIRECODE	"V"-T&G	24"	8'	2,600
	BAXBORD Insulating	"V"-T&G	24"	8'	2,600
	BAXBORD FIRECODE Insulating	"V"-T&G	24"	8'	2,600
$\frac{1}{2}$ "	BAXBORD	"V"-T&G	24"	8'	2,025
	BAXBORD	Square	48"	8', 12'	2,025
	BAXBORD Insulating	"V"-T&G	24"	8'	2,070
$\frac{3}{8}$ "	BAXBORD	Square	24"	8'	1,526
	BAXBORD	Square	48"	8', 12'	1,526
	BAXBORD Insulating	Square	24", 48"	8'	1,556
1"	Coreboard	"V"-T&G	24"	Various	4,150
	Coreboard (Prescored 6" & 8")	Square	24"	Various	4,150

WHERE TO USE SHEETROCK WALLBOARDS

Construction (thickness)→	Regular 1/4" 3/8"	FIRECODE Wallboard 5/8" 1/2"	Insulating (Foil back) 3/8" 1/2"	ULTRAWALL Panels 5/8" 3/8" only	Vinyl Wallbd. 3/8" 1/2" only	W/R Wallbd. 1/2" 1/2"	BAXBORD Backing Board 5/8"
WALLS							
Interior Walls							
Single Layer	X	X	XXXX		X		
over existing walls							
masonry (furred)							
wood framing							
metal framing							
Double Layer							
masonry (furred)	XX	XX	XX	XX	X	X	X
base							
finish							
wood framing							
base							
finish							
metal framing							
base							
finish							
Ceramic or Other Tile Base							
masonry (furred)							
wood framing							
metal framing							



Metal Wallboard Accessories

No. 100 PERF-A-BEAD is a metal corner reinforcement formed of galvanized steel with PERF-A-TAPE wings $1\frac{1}{4}$ " wide (A). Easily applied with PERF-A-TAPE Joint Compound; provides lasting protection for external corners.

DUR-A-BEAD* is an all-metal heavy gauge hot dipped galvanized steel reinforcement for protecting external corners (B). It is nailed to framing through gypsum wallboard and concealed with PERF-A-TAPE Joint Compound as a smooth, finished corner. Available in three flange widths: **No. 101** 1"x1"; **No. 102** 1"x $1\frac{1}{4}$ "; **No. 103** $1\frac{1}{4}$ "x $1\frac{1}{4}$ ". Also available in lighter gauge **ECONO** models: Standard $15/16$ "x $15/16$ "; **No. 102** 1"x $1\frac{1}{4}$ "; **No. 103** $1\frac{1}{4}$ "x $1\frac{1}{4}$ "; **No. 104** $1\frac{1}{8}$ "x $1\frac{1}{8}$ ".

USG Metal Trims offer protection and finished edges for gypsum wallboard at window and door jambs, at ceiling angles and at intersections where wallboard abuts other materials. Easily nailed through the channel and wallboard into the framing. Eliminates precision cutting and mitering with simply butted joints. Finished with PERF-A-TAPE Joint Compound (except No. 400 series). Made in three types, ten sizes:

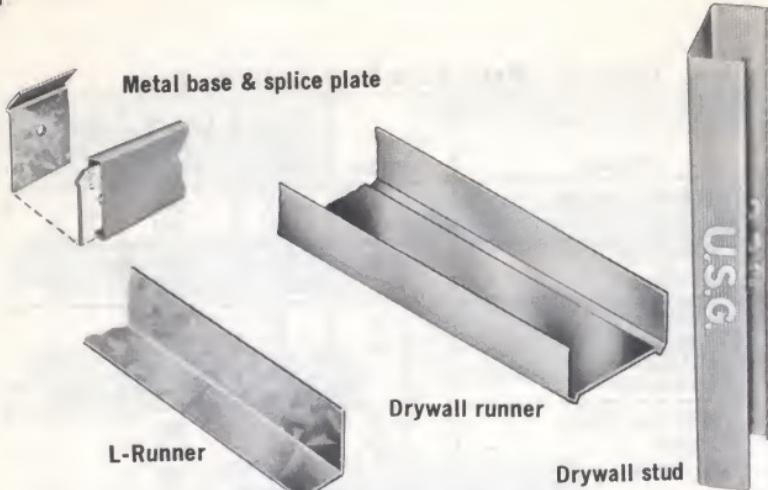
No. 200 series—steel casing, includes **No. 200-A** U-shaped channel (C) in $\frac{1}{2}$ " and $\frac{5}{8}$ " sizes; **No. 200-B** L-shaped angle (D) edge trim without back flange to simplify application, in $\frac{1}{2}$ " and $\frac{5}{8}$ " sizes; **No. 200-C** L-shaped trim (E), requires slotted jamb for installation in most cases, open "V" edge of flange inserts into kerf to make trim adjustable for use with $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{5}{8}$ " gypsum wallboard.

PERF-A-TRIM* **No. 300 series**—galvanized channel with a PERFA-TAPE flange attached (F), suitable for single or double layer wallboard construction, includes **No. 300** in $\frac{3}{8}$ " size and **No. 301** in $\frac{1}{2}$ " size.

No. 400 series—reveal type all-metal trim (G), requires no finishing compound, includes **No. 400** in $\frac{3}{8}$ " size, **No. 401** in $\frac{1}{2}$ " size, **No. 402** in $\frac{5}{8}$ " size.

Table III. Metal Edge Trim Specifications

Product	Length	Pcs. per Ctn.	Lin. Ft. per Ctn.	Approx. Weight Lbs./MLF
No. 100 PERF-A-BEAD (200' ctns.)	6' 8" 8'	30 25	200 200	55
No. 100 PERF-A-BEAD (1000' ctns.)	6' 8" 8'	150 125	1,000 1,000	60
No. 101 DUR-A-BEAD (200' ctns.) 1"x1" Flange	6' 8" 6'10" 8' 10'	30 30 25 20	200 205 200 200	125
No. 101 DUR-A-BEAD (500' ctns.) 1"x1" Flange	6' 8" 6'10" 8' 10'	75 75 63 50	500 513 504 500	125
No. 102 DUR-A-BEAD 1½ "x1" Flange	6' 8" 8' 10'	75 63 50	500 504 500	132
No. 103 DUR-A-BEAD 1½ "x1¼ " Flange	8' 10'	63 50	504 500	148
ECONO* STANDARD 15/16 "x15/16 " Flange	8'	63	504	97
ECONO No. 102 1½ "x1" Flange	8'	63	504	122
ECONO No. 103 1½ "x1¼ " Flange	8'	63	504	122
ECONO No. 104 1⅛ "x1⅛ " Flange	8'	63	504	122
No. 200-A ½ " USG Metal Trim U-shaped	7' 10'	50 50	350 500	112
No. 200-A 5/8 " USG Metal Trim U-shaped	7' 10'	50 50	350 500	118
No. 200-B ½ " USG Metal Trim L-shaped	7' 10'	50 50	350 500	94
No. 200-B 5/8 " USG Metal Trim L-shaped	7' 10'	50 50	350 500	94
No. 200-C USG Metal Trim L-shaped	7' 10'	50 50	350 500	114
No. 300 ¾ " PERF-A-TRIM	7' 10'	50 50	350 500	142
No. 301 ½ " PERF-A-TRIM	7' 10'	50 50	350 500	168
No. 400 ¾ " USG Metal Trim Reveal Type	7' 8' 9' 10'	50 50 50 50	350 400 450 500	150
No. 401 ½ " USG Metal Trim Reveal Type	7' 8' 9' 10'	50 50 50 50	350 400 450 500	182
No. 402 ¾ " USG Metal Trim Reveal Type	7' 8' 9' 10'	50 50 50 50	350 400 450 500	190



USG Drywall Studs are non-load bearing channel type studs roll formed from 25-ga. electro-galvanized steel, designed for screw attachment of $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{5}{8}$ " SHEETROCK Wallboard in the USG Metal Stud Partition System and certain other gypsum drywall systems (see Chapter 4 for construction details). Knockouts are located 12" from each end of the stud (24" from end in western part of country) for pipe and conduit installation. Packaged: 10 pcs. per bdl.; available as follows:

Designation	Width	Length	Wt./MLF
DWS-158	$1\frac{1}{8}$ "	8', 9'	340 lbs.
DWS-212	$2\frac{1}{2}$ "	8', 9', 10', 12'	430 lbs.
DWS-358	$3\frac{5}{8}$ "	8', 9', 10', 12', 16'	510 lbs.

USG Drywall Runners are roll formed 25-ga. electro-galvanized steel channel-type sections designed to receive USG Drywall Studs and to secure various types of U.S.G. partitions to floor and ceiling. Length: 10'; packaged: 10 pcs. per bdl.; available as follows:

Designation	Width	Wt./MLF
DWR-158	$1\frac{1}{8}$ "	207 lbs.
DWR-212	$2\frac{1}{2}$ "	331 lbs.
DWR-218	$2\frac{5}{8}$ "	380 lbs.
DWR-358	$3\frac{5}{8}$ "	414 lbs.

"L" Shaped Metal Drywall Runners are $1\frac{1}{8}$ "x $\frac{7}{8}$ "x22 ga. electro-galvanized steel angle sections used to secure 1" core board at floor and ceiling in USG Solid, Double Solid and Triple Solid Partitions. Length: 10'; packaged: 10 pcs. per bdl.; weight: 176 lbs. per MLF.

USG Metal Base provides a $2\frac{1}{2}$ " wide 18-ga. metal face plate as a flush-type or reveal-type wall base. Length: 10'; finish: one coat rust-inhibitive primer; packaged: 10 pcs. per bundle. Available either painted weighing 600 lbs. per MLF or galvanized and painted weighing 640 lbs. per MLF.

USG Splice Plates are used to attach face plates to the partition and to connect plates at joints.



DWC furring channel



RC-1 channel



DWC clip



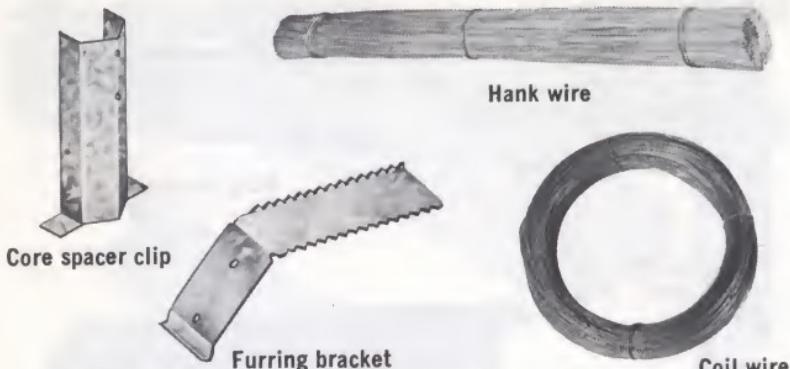
Cold-rolled channels

DWC Drywall Furring Channels are ceiling and wall furring channels made of 25-ga. electro-galvanized steel designed for attachment of $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{5}{8}$ " SHEETROCK Wallboard with 1" USG Drywall Screws-Type S. Face width: $1\frac{1}{8}$ "; length: 12', packaged: 10 pcs. per bdl.; weight: 320 lbs. per MLF.

DWC Furring Channel Clips are made of galvanized wire and used in attaching DWC Furring Channels to $1\frac{1}{2}$ " cold-rolled runner channels. They are installed on alternate sides of the carrying channels; where clips cannot be alternated, wire tying is recommended. Packaged: 500 pcs. per ctn., weight: 36 lbs. per M pcs.

USG Cold-Rolled Channels, made of 16-ga. steel, are used for furring, and in suspended ceilings and partition construction. Available either galvanized or black asphaltum painted. Sizes: $\frac{3}{4}$ ", with $\frac{1}{2}$ " flange; $1\frac{1}{2}$ ", with $19/32$ " flange; 2", with $19/32$ " flange. Lengths: 16' and 20'; packaged: 20 pcs. per bdl. $\frac{3}{4}$ " size, 10 pcs. per bdl. $1\frac{1}{2}$ " and 2" size; weight: $\frac{3}{4}$ "-300 lbs. per M lin. ft., $1\frac{1}{2}$ "-500 lbs./MLF, 2"-590 lbs./MLF.

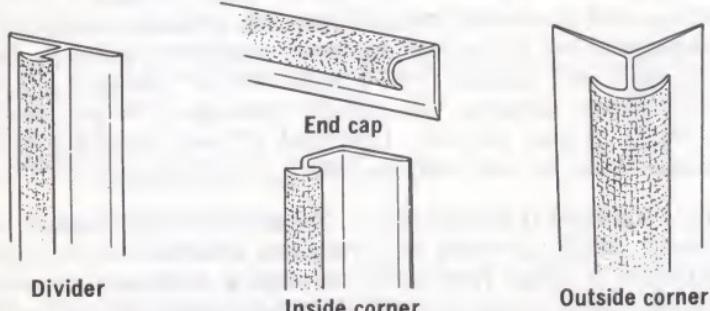
RC-1 Resilient Channel is a 25-ga. electro-galvanized steel channel which provides for resilient attachment of gypsum wallboard to wood framing or through a wallboard base layer in double-layer application to USG Metal Studs. Widely used to improve sound transmission loss in partitions and ceilings of garden-type apartments, motels and other structures. Pre-punched holes 4" o.c. in the flange facilitate screw fastening to framing members; SHEETROCK is attached to channel by 1" or $1\frac{1}{8}$ " USG Drywall Screws-Type S. Width: $2\frac{3}{4}$ "; length, 12', packaged: 20 pcs. bdl., weight: 213 lbs. per MLF. *Limitation:* must not be installed beneath highly flexible wood floor joists. RC-1 Channels are attached to ceilings with $1\frac{1}{4}$ " USG Drywall Screws-Type W—nails must not be used; see Wood Framing Requirements page 10.



USG Core Spacer Clips, made of 20-ga. galvanized steel, 4" in height, are used in centering gypsum coreboard in DWR-218 Drywall Runners for the USG 2" Solid Gypsum Drywall Partition. Packaged: 250 pcs. per ctn., weight: 110 lbs. per M pcs.

USG Adjustable Wall Furring Brackets are used for attaching $\frac{3}{4}$ " furring channels and DWC Furring Channels to exterior masonry walls. Made of 20-ga. galvanized steel with serrated edges, they are wire-tied to horizontal stiffeners, 24" o.c., in braced furring systems. Packaged: 500 pcs. per ctn., weight 52 lbs. per M pcs.

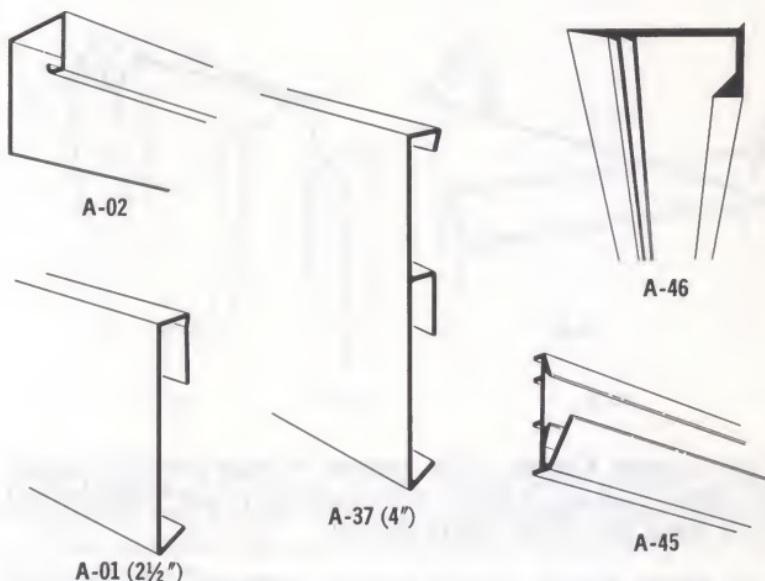
USG Galvanized Tie and Hanger Wire—9 ga. wire, for hanging $1\frac{1}{2}$ " and 2" runner channels in suspended ceilings is available in 50 lb. coils. 16 ga. and 18 ga. soft annealed wire, used for wall furring to tie furring channels to runner channels in ceiling construction, is available in 50 lb. coils and 25 lb. hanks (28" straight lengths).



SHEETROCK Moldings are available in permanently bonded matching finishes to enhance the beauty and durability of ULTRAWALL and SHEETROCK Vinyl Wallboard installations. Made of precision extruded aluminum, they cover joints and protect corners. Four shapes—Divider, Inside Corner, Outside Corner and End Cap—match the five woodgrained finishes of $\frac{3}{8}$ " ULTRAWALL, the three pastel finishes of $\frac{3}{8}$ " ULTRAWALL Colorcast, and the nine standard colors of $\frac{1}{2}$ " SHEETROCK Vinyl Panel Wallboard. The 8' lengths are easily cut and mitered. Packaged 20 lengths per tube.

SHEETROCK Demountable Products

A full line of specially designed accessories is available for use with the exclusive USG Demountable partition systems. Panels of $\frac{1}{2}$ " thick regular, Vinyl Panel or Custom Vinyl SHEETROCK Wallboard and $2\frac{1}{2}$ " USG Metal Studs and Drywall Runners are combined to create finished movable partitions of ceiling, cornice or bank rail height. These easily installed, quickly relocated partitions use aluminum, steel and plastic components in various combinations to provide modern, low-cost space division.



Aluminum Components are extruded sections with a satin finish and an abrasion and corrosion-resistant natural anodized coating.

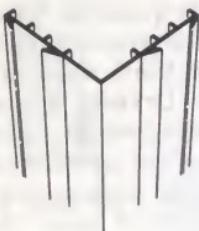
A-02 Ceiling Trim provides protection and finished edges to face panels on ceiling height partitions. Easily secured to ceiling runner with USG Metal Lock Fastener *before* wallboard is applied.

A-46 Drive-In Ceiling Trim provides face panel edge protection and trim on ceiling height partitions. Readily driven into place with plastic headed hammer *after* wallboard is erected. Not recommended for use with exposed grid ceiling systems having grid modules greater than 4'.

A-45 Picture Mold provides ceiling trim and picture mold on ceiling height partitions. Designed for application to ceiling runner with Type S screws *after* wallboard is erected.

A-01 (2½") Base serves as a finished exposed-type base with simple snap-on application over USG Metal Base Splice Plates. Easily notched and bent to form outside corners, butted at inside corners and over splice plates for continuous runs.

A-37 (4") Base is an alternate 4" high exposed type base applied the same as 2½" Base, A-01.



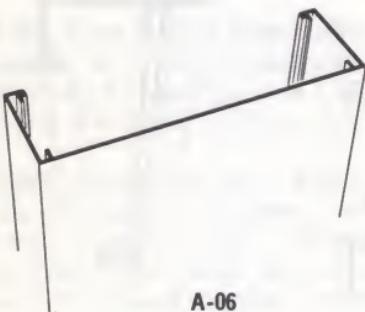
A-03



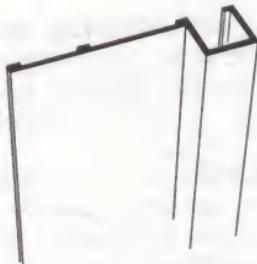
A-38



A-04



A-06



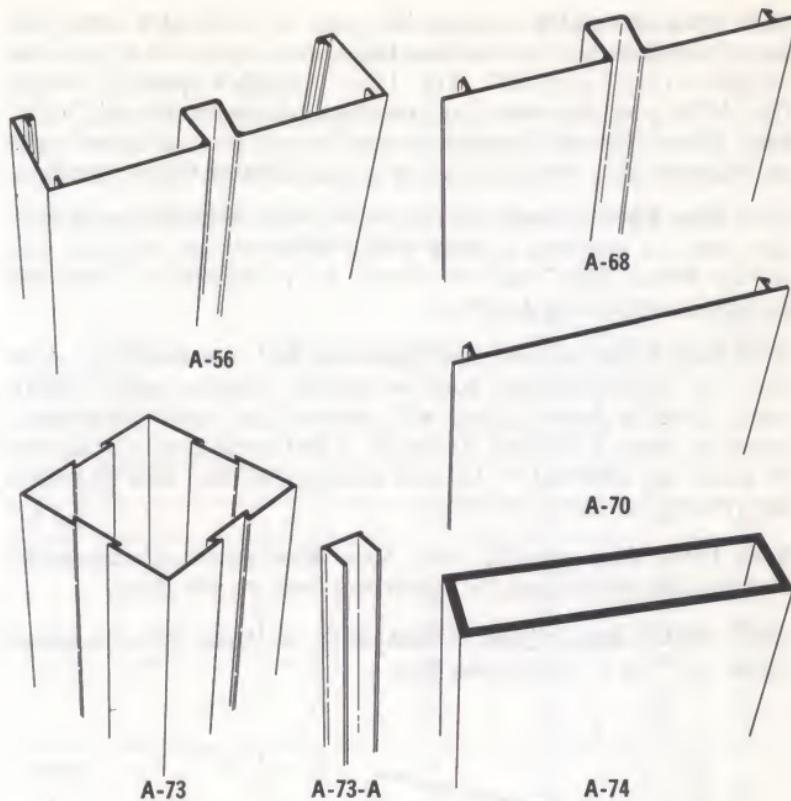
A-72

A-03 Exterior Corner, A-38 Interior Corner provide rugged, decorative corners. Comes with predrilled and counterbored screw holes and batten insert groove.

A-04 Batten finishes vertical gypsum wallboard joints or may be used as alternate for interior corner. Has predrilled and counterbored screw holes and batten insert groove.

A-06 Rail fits over wallboard and studs or runners to provide rigidity and a finished trim. Serves as bank rail cap and bottom rail, unglazed cornice cap, glazed cornice sill cap, partition terminal, component for door frame assembly and glazing component.

A-72 Door Stop provides for the installation of $1\frac{3}{4}$ " hollow core doors in the ceiling and cornice height partitions. Available in sets of two jamb sections and one header section for 3'x 7' doors with right hand or left hand openings. Sections are mitered. One jamb section is punched for three 4"x4" hinges. The other jamb section is punched for a standard strike plate (lock cutout) and for three rubber door bumpers which are included in the set. All sections have punched and counterbored holes for attachment with $\frac{7}{8}$ " oval head drywall finishing screws. Also available in unfabricated 10' lengths without miters, holes or cutouts to permit job fabrication for special hardware or other conditions.



A-56 Glazing Rail serves as the intermediate mullion glazing component and cornice cap in glazed cornice height partitions and the borrowed light jamb and header trim sections in ceiling height partitions.

A-68 Glazing Rail Cover is designed as a glazing component for snap-in use with the A-56 Glazing Rail and A-06 Rail.

A-70 Plain Rail Cover is used as a snap-in head or terminal closure for A-56 Glazing Rail and A-06 Rail.

A-73 Post is used with the S-36 Post Assembly as a glazing post for bank rail partitions and corner post for glazed cornice partitions.

A-73-A Post Channel slides into groove in A-73 Post to hold glass. Also receives horizontal edge of glass in bank rail partitions and when inverted provides horizontal glazing stops for glazed cornice and ceiling height partitions.

A-74 Pedestal provides support for the bottom rail on bank rail partitions erected off the floor.

Steel Components used in all SHEETROCK Demountable Partitions are **USG Metal Studs DWS-212 (2½")**, and **USG Metal Runners DWR-212 (2½")**, both made from electro-galvanized steel (see page 34 for detailed description). Other steel components, all galvanized to provide corrosion-resistance and minimize galvanic action with aluminum components, have been designed for special applications. These are listed on page 40.

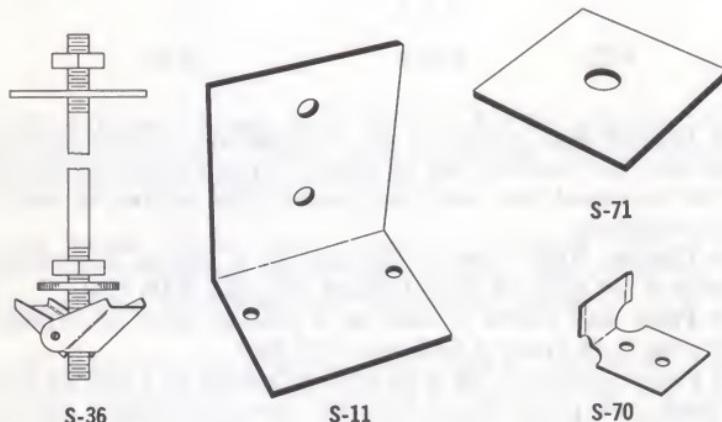
S-36 Post Assembly consists of one $\frac{3}{8}$ " threaded rod, two jamb nuts, one washer and one toggle nut. Available in two rod lengths— $13\frac{1}{2}$ " and 48". The $13\frac{1}{2}$ " length is used to secure the A-73 post in bank rail partitions accommodating $11\frac{1}{2}$ " high glass. The 48" length is used to secure the corner post and intermediate mullions in the glazed cornice height partition.

S-71 Post Plate is used with the S-36 Post Assembly as a back up plate in securing glazing posts, intermediate mullions and corner posts. Also used to secure A-74 Pedestal in bank rail partitions erected *off the floor*.

S-70 Rail Clips provide for alignment and attachment of A-06 Rail to A-56 Glazing Rail in glazed cornice height partitions. Used at door frames, wall intersections, and intermediate mullions when S-36 Post Assembly is not applicable. Clips, used in pairs, are screwed to the flat glazing rail web and fit snugly into the legs of the A-06 Rail.

S-11 Floor Clip provides firm floor attachment of stud at the terminating end of bank rail partitions built *on the floor*.

USG Metal Base Splice Plates serve as base clips to attach either $2\frac{1}{2}$ " or 4" aluminum base.



Plastic Components are designed for durability, low cost and attractive appearance. The gray color is highly complementary to the natural aluminum trim and rich decorator colors of SHEETROCK Vinyl Panel Wallboard. Parts are compression molded from high impact vinyl plastic except as noted.

P-05 Batten Insert provides a decorative gray color trim to cover screw heads. Made of flexible extruded polyethylene for easy insertion in A-04 Batten, A-03 Exterior Corner, A-38 Interior Corner and (optional) in A-45 Picture Mold. Also available in black color, **P-06 Batten Insert**.

P-10 Glazing Spline, made of black flexible extruded polyethylene, is designed for use with $7/32$ " and $1/4$ " thick glass.

P-69 Post Cap provides decorative gray cover and finish to A-73 Glazing Post on bank rail partitions. Also available in black color, **P-70 Post Cap**.

P-75 Base Closure Cap serves to finish ends of A-01 2½" Aluminum Base at door frames and partition terminals. Also available: **P-76 Base Closure Cap** for A-37 4" Aluminum Base.

Table IV. SHEETROCK Wallboard Demountable Product Specifications

Product	Part No.	Length	Pcs. /Ctn.	Lin. Ft. /Ctn.	Ctn. Weight (lbs.)
Ceiling Trim	A-02	10'	36	360	66
Drive-In Ceiling Trim	A-46	12'	36	432	72
Picture Mold	A-45	15'	20	300	57
2½" Base	A-01	10'	36	360	88
4" Base	A-37	15'	20	300	114
Exterior Corner	A-03	8' 9' 10' 12'	10 10 10 10	80 90 100 120	25 29 32 38
Interior Corner	A-38	8' 9' 10' 12'	10 10 10 10	80 90 100 120	21 23 26 28
Batten	A-04	8' 9' 10' 12'	75 75 75 75	600 675 750 900	73 82 92 110
Rail	A-06	15'	15	225	105
Door Stop for 1¾" door 3'x7' LH or RH Straight Length	A-72	3 pc. set 10'	6 sets 12	— 120	34 40
Glazing Rail	A-56	15'	10	150	78
Glazing Rail Cover	A-68	15'	10	150	60
Plain Rail Cover	A-70	15'	10	150	52
Post	A-73	10'	4	40	32
Post Channel	A-73-A	10'	20	200	16
Pedestal	A-74	10'	4	40	60
Post Assembly	S-36 S-36	13½" 48"	12 sets 6 sets	— —	5 8½
Post Plate	S-71	—	50	—	9½
Rail Clips	S-70	—	100	—	3½
Floor Clip	S-11	—	20	—	9
Batten Insert—Gray	P-05	100' roll	10 rolls	1,000	6
Batten Insert—Black	P-06	100' roll	10 rolls	1,000	6
Glazing Spline	P-10	200' roll	5 rolls	1,000	5
Post Cap—Gray	P-69	—	50	—	½
Post Cap—Black	P-70	—	50	—	½
Base Closure Cap—2½"	P-75	—	50	—	½
Base Closure Cap—4"	P-76	—	50	—	½



Regular Blanket



Sound Attenuation Blanket

Sound Control Products

Adequate sound control is one of the fastest growing requirements in today's buildings. The public has become sufficiently "noise-conscious" to demand effective measures to control unwanted sound in both commercial and residential construction. With its advanced research, U.S.G. has been a leader in developing new systems and products for efficient, low-cost sound control for all types of new construction and remodeling.

USG Wood Fiber Sound Deadening Board, a $\frac{1}{2}$ " thick, 4' wide, low-density board, is used behind gypsum wallboard to reduce sound transmission through a partition (see Chapter 5 for technical data). This structural board is easily nailed to 2x4 wood studs and provides a resilient base for the adhesive application of wallboard. Limited to interior uses only. Gypsum board face layer must be permanently nailed. Not recommended as a base layer in radiant heated ceilings. Lengths: 4', 8', 10' and 12', packaged: 6 pcs. per bdl., weight: 750 lbs. per M sq. ft.

USG Mineral Fiber Sound Deadening Board is a $\frac{1}{2}$ " thick, 4' wide incombustible rigid type board used behind gypsum wallboard to reduce sound transmission through a USG Metal Stud partition (see Chapter 5 for details). Lengths: 8' and 9', packaged: 6 pcs. per bdl., weight 1030 lbs. per M sq. ft.

THERMAFIBER* Insulating Wool (Regular) Blankets consist of mineral fibers mechanically formed into a uniform mat of definite dimension and controlled density. One side is enclosed with a strong asphalted paper which also forms nailing flanges. The breather side is enclosed in a durable fire-resistant, porous kraft paper; open faced batts are available if required. Specifications:

Thickness	Width (in.)	Length (ft.)	Approx. Weight-psf
2"	15, 19, 23	4, 8, 24	0.33
3"	15, 19, 23	4, 8, 24	0.47

THERMAFIBER Sound Attenuation Blankets are semi-rigid, paperless, spun mineral fiber blankets of uniform dimension and controlled density. When inserted in the partition cavity from floor to ceiling, these blankets help provide excellent fire ratings and substantially increase STC ratings of partitions. Available: 2" thick for use with USG SHEETROCK Demountable System, and 1½" thick for the USG Metal Stud, Double Solid and Triple Solid Partition Systems. Specifications:

Thickness	Density lb./cu. ft.	Size	Pcs. per Package	Sq. ft. per Package
1½"	3	24"x48"	11	88
2"	2½	24"x48"	8	64

Fasteners and Adhesives

USG Drywall Screws are the result of many years of development aimed at producing the best possible attachment of SHEETROCK Wallboard to steel, wood or gypsum supports simply and quickly. A complete line of 16 different special, self-drilling, self-tapping steel screws have been made available to improve construction systems and simplify installation methods. All drywall screws are highly corrosion resistant and have a Phillips head recess for easy installation with a special bit and power-driven screw driver. Wallboard is fastened to steel framing with the Type S screw, to wood framing with the Type W screw, and to gypsum studs or coreboards with the Type G screw.

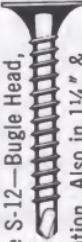
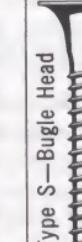
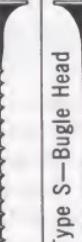
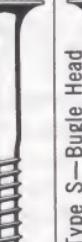
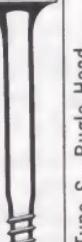
The special patented bugle head used when attaching wallboard spins the face paper into the cavity under the screw head and produces a uniform depression free of fuzz for proper and easier spotting. Defects due to excessive or improper nail dimpling are eliminated. Other head designs are available for the assembly of metal framing and installation of wood and metal trim.

Type S screws have a patented drill point and special design threads that provide maximum holding power in steel studs, minimize thread stripping. Special Hi-Lo threads on Type G and Type W screws speed installation, provide excellent holding power in gypsum or the varied woods used in framing.

The ability of drywall screws to pull the gypsum wallboard tightly to the framing without damaging the board has virtually eliminated loose board attachment and consequent problems of "fastener pops" in wood frame construction. Fewer screws than nails are generally required. Speed of installation compares favorably with nailing when electric screw guns (see Chapter 7) are used. An adjustable screw depth control assures uniformity of penetration, protects the face paper, minimizes core fracturing.

Although "fastener pops" caused by loose wallboard are eliminated, screws will not prevent "pops" due to excessive wood shrinkage or warping and twisting of framing. Correct selection and proper use of the screw recommended for the specific application is most important. Regardless of the attachment method used satisfactory results also depend on meeting proper framing, heating and ventilating requirements (see Chapter 1).

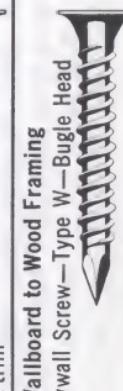
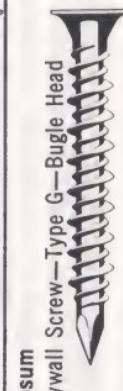
SELECTOR AND SPECIFICATION GUIDE FOR USG DRYWALL SCREWS

Description	Fastening Applications	#1 Pkg.—Bulk with bits			#3 Packages†	
		M qty.	Lbs. wt.	No. of bits	M qty.	Lbs. wt.
SHEETROCK Wallboard to Metal Framing 1" USG Drywall Screw—Type S—Bugle Head 	Single Layer SHEETROCK Wallboard to 25-ga. SHEETROCK Wallboard to RC-1 Resilient Channel SHEETROCK Wallboard to metal furring Battens strips in movable partition system	16	53	2	2	6
1" USG Drywall Screw—Type S-12—Bugle Head, bronze tinted for identification. Also in 1 1/4" & 1 1/8" lengths. 	SHEETROCK Wallboard to 12-ga. (max.) steel studs	16	52	2	2	6 1/2
1 1/4" USG Drywall Screw—Type S—Bugle Head 	1" core units to L runner in 2" Solid, Semi-Solid, Double-Solid and Triple-Solid Partition Systems. USG Metal Base and splice plates.	16	61	2	2	7 1/2
1 5/8" USG Drywall Screw—Type S—Bugle Head 	Double-layer SHEETROCK Wallboard to 25-ga. steel studs Double-layer furring SHEETROCK Wallboard to metal furring	8	44 1/2	2	1	5 1/2
1 7/8" USG Drywall Screw—Type S—Bugle Head 	1/2" SHEETROCK Wallboard face layers to L runners in 2" Solid, Semi-Solid, Double-Solid and Triple- Solid Systems	8	47 1/2	2	2	12*
2 1/4" USG Drywall Screw—Type S—Bugle Head 	5/8" SHEETROCK Wallboard face layers to L runners in 2" Solid, Semi-Solid, Double-Solid and Triple- Solid Partition Systems Face-layer SHEETROCK Wallboards—at floor line —in Metal Stud and RC-1 Resilient Channel Systems	8	60	2	2	15*

For steel applications not shown, select a screw length which is at least
 $\frac{3}{16}$ " longer than the total thickness of the materials to be fastened. This
 $\frac{3}{16}$ " of screw penetration provides maximum holding strength.

*Screws supplied 4 pkgs. per Master Carton.
 **Includes 1 bit per 2M screws
 †Also available in No. 2 Master Cartons, 4 or 8 pkgs. per ctn., same no. bits as in bulk.

USG Drywall Screws Patent Nos. 2,871,752, 3,056,234, 3,125,923. Other Patents Pending (U.S. and Foreign)

Wood Trim to Metal Framing		Wood trim over single-layer SHEETROCK Wall-board on 25-ga. Steel studs	8	36	4	2**	9*
2 1/4" USG Drywall Screw—Type S—Trim Head		Wood trim over double-layer SHEETROCK Wall-board on 25-ga. steel studs	8	53	4	2**	13*
Metal Studs to Door Frames, Runners		Metal door frame to 12-ga. (max.) steel studs. Metal studs to metal runners. Also in 1/2" size for E-Z Wall application.	24	54	2	5	11*
Metal Trim & Door Hinges to Metal Framing		Door hinges to door frame and aluminum components to metal	16	64	2	2**	8
1 1/4" USG Drywall Finishing Screw—Type S—Bugle Head, cad. plated to match hardware & trim		Aluminum rail to metal studs in USG demountable partition system	1	4	0	1	4
SHEETROCK Wallboard to Wood Framing		Single-layer SHEETROCK Wallboard to wood	16	60	2	2	8 1/2
Gypsum to Gypsum		Multi-layer gypsum to gypsum. (do not use for double layer 3/8" SHEETROCK Wallboard laminated partitions.)	8	45	2	2	11*

Wallboard Nails have been vastly improved since the relationship of wood shrinkage to nail popping was discovered. Nails have been developed to concentrate maximum holding power over the shortest possible length—notably the annular ring type nail which has about 20% greater holding power than a cement-coated cooler type nail of the same length. However, under lengthy, extreme drying conditions such as during a long, cold dry winter resulting wood shrinkage may cause fastener pops.

even with the annular ring nail (see Wood Shrinkage, Chapter 6).

As with screws, specification of the proper nail for each application is extremely important, particularly for fire-rated construction. The nails recommended below comply with performance standards adopted by the Gypsum Association. Nails, except USG Matching Color Nails, are not available from U.S.G.

SELECTOR GUIDE FOR WALLBOARD NAILS

Fastening Applications	Fastener Description	Nail Spacing C. to C. (1)	Approx. Lbs. Nails Req'd per MSF SHEETROCK
$\frac{1}{2}''$, $\frac{3}{8}''$ and $\frac{1}{4}''$ SHEETROCK Wallboard; $\frac{1}{2}''$ and $\frac{3}{8}''$ BAXBORD Gypsum Backing Board to wood frame (2) (3)	$1\frac{1}{4}''$ GWB-54 Annular Ring Nail 12½ ga.; with a slight taper to a small fillet at shank; bright finish; medium diamond point	$7''$ ceiling $8''$ walls	$5\frac{1}{4}$
$\frac{5}{8}''$ SHEETROCK Wallboard to wood frame (3)	$1\frac{3}{8}''$ Annular Ring Nail (Same as GWB-54 except for length)	$7''$ ceiling $8''$ walls	$5\frac{1}{4}$
$\frac{5}{8}''$ SHEETROCK FIRECODE Wallboard face layers to staggered wood studs over $\frac{1}{2}''$ USG Wood Fiber Sound Deadening Board	$2\frac{1}{2}''$ 7d Gypsum Wallboard Nail Cement Coated, 13 ga., $\frac{1}{4}''$ dia. head	$7''$ walls (face layer)	9

$\frac{3}{8}''$ and $\frac{1}{4}''$ SHEETROCK Wallboard over existing surface, wood frame	$1\frac{1}{8}''$ 6d Gypsum Wallboard Nail Cement Coated, 13 ga., $\frac{1}{4}''$ dia. head		$7''$ ceiling $8''$ walls	$6\frac{1}{4}$
$\frac{5}{8}''$ SHEETROCK FIRECODE Wallboard to wood frame	$1\frac{7}{8}''$ 6d Gypsum Wallboard Nail Cement Coated, 13 ga., $\frac{1}{4}''$ dia. head		$6''$ ceiling $7''$ walls	$6\frac{3}{4}$
$\frac{1}{2}''$ SHEETROCK FIRECODE Wallboard to wood frame	$1\frac{5}{8}''$ 5d Gypsum Wallboard Nail Cement Coated, 13½ ga., $\frac{15}{64}''$ dia. head		$6''$ ceiling $7''$ walls	$5\frac{1}{4}$
$\frac{5}{8}''$ SHEETROCK FIRECODE Wallboard; $\frac{5}{8}''$ BAXBOARD FIRECODE Gypsum Backing Board to steel nailing channel —over existing surface, wood frame (3)	$1\frac{1}{4}''$ Fetter Annular Ring Nail 11 ga., $\frac{5}{16}''$ dia. head		$6''$ ceiling	6
ULTRAWALL Panels ULTRAWALL Colorcast Panels —to wood frame (3) —over existing surface, wood frame (3)	$1\frac{1}{8}''$ USG Matching Color Nail (Steel) $1\frac{1}{8}''$ USG Matching Color Nail (steel)		$8''$ walls $8''$ walls	$1\frac{1}{2}$ $4\frac{1}{2}$
SHEETROCK Vinyl Panel Wallboard (9 colors) to wood frame (3)	$1\frac{3}{8}''$ USG Matching Color Nail (Brass)		$8''$ walls	$1\frac{3}{4}$

NOTES: (1) Spacing shown are for single layer application without adhesive. (2) See Wood Framing Requirements and Heating Recommendations, Chapter 1. (3) Nails shown for this application are also the proper size for use with adhesive.

USG Drywall Adhesives represent the latest advancement in wallboard attachment where the finest room interiors are desired. Their use greatly reduces the nail or screw fastening otherwise required, thus saves labor on spotting and sanding.

Two USG adhesives are recommended for laminating gypsum wallboard to gypsum backing board in multi-layer partitions and ceilings; **PERF-A-TAPE** Joint Compound (embedding type) and **USG Laminating Adhesive**, both dry powder products, applied by spreader, require mixing and temporary fastening in application; qualify for fire-rated construction.

Two **SHEETROCK** Brand adhesives, DWA-14 and DWA-10, are designed to adhere wallboard directly to wood framing with a minimum of supplemental fasteners required. A water-based contact bond drywall adhesive, commercially available, is used to laminate **SHEETROCK** Gypsum Wallboard to USG Metal Studs in the USG Demountable Partition System (see Chapter 4).

TABLE V. SHEETROCK Brand Adhesive Specifications

Type Adhesive	Item	Items per Package	Gross Wt. Lbs./Pkg.
DWA-10	5 gal. can 1/4 gal. ctdgs.	1 can 12/ctn.	52 30½
DWA-14	5 gal. can 1/4 gal. ctdgs.	1 can 12/ctn.	46 29
PERF-A-TAPE Joint Compound (embedding type)	32 lb. bag 25 lb. bag	1 bag 1 bag	32½ 25½
USG Laminating Adhesive	25 lb. bag	1 bag	25½



Selector Guide For Drywall Adhesives

Application & Description	Features
SHEETROCK Wallboard to BAXBORD Gypsum Backing Board or SHEETROCK base layer	
PERF-A-TAPE Joint Compound (embedding type)—mixed with water, applied with spreading tool	Tight bond; permits adjustment of boards after contact; temporary fastening required; qualifies for fire-rated construction
USG Laminating Adhesive—mixed with water, applied with spreading tool	Excellent bond; levels minor mis-alignments; temporary fastening required
SHEETROCK Wallboard to USG Sound Deadening Board	Excellent bond; supplemental fastening required
SHEETROCK Wallboard to wood framing	Conforms to ASTM C-557-65T
DWA-14 Adhesive—applied in continuous bead to face of framing members with cartridge gun	50% to 100% greater bond strength than with conventional fastening; eliminates all field nails on walls, most nails on ceilings; bridges minor framing irregularities; not to be used with Insulating SHEETROCK (1)
DWA-10 Mastic—applied to continuous bead to face of framing members with cartridge gun	Reduces face nailing needed by 50%; reduces impact sound; requires supplemental fasteners at 12" to 16" intervals into all 16" framing; can be used with Insulating SHEETROCK Wallboard (1)

1) Not to be used in fire-rated construction.



Joint Treatment Products

DESCRIPTION

Today's complete U.S.G. joint treatment line includes both ready-mixed and powder-type joint compounds, fiber reinforcing tape suitable for application by either hand tools or mechanical taping tools, new one-day joint system, special topping compounds, and laminating adhesive. In addition to conventional joint finishing and fastener spotting, certain of these products are designed for repairing cracks, patching, spackling, back-blocking, and for laminating layers in gypsum wallboard double-layer systems.



ADVANTAGES

In **PERF-A-TAPE** and **DURABOND** Joint Compounds, these qualities of superiority have been developed:

Excellent Bond—holds tight under normal conditions.

Reduced Ridging—joints harden out smoother; low shrinkage and tight cohesion; reduce sanding to minimum; allow faster preparation for decorating.

Smooth Working—easy mixing, excellent slip, ample wet mix life; no alkali burning of paint.

In **PERF-A-TAPE** Reinforcing Tape, both comparative tests and long field usage have established these performance advantages:

Strength—greatest cross tensile strength, producing joints as strong as the board itself.

Crack Resistance—chamfered edges are wafer-thin for easy embedding, greater holding power to resist edge cracking.

Natural Bond—tape truly adheres to compound; spark perforations minimizes photographing; tape has least longitudinal stretch; is pre-creased for easier folding.

Use of U.S.G. joint treatment brings the important added advantage of dealing with a single manufacturer who is responsible for all components of the finished wall or ceiling—all made by U.S.G. to work together.

GENERAL LIMITATIONS

1. For interior use only; not intended for use on wood or wood fiber products (except in certain lamination applications—see **PERF-A-TAPE** Joint Compound below).

2. Bagged products require protection against wetting.

3. Each compound coat must be dry before next is applied. Completed joint treatment must be thoroughly dry before proceeding with decoration.

PERF-A-TAPE Joint System consists of **PERF-A-TAPE** Compound (powder type) and **PERF-A-TAPE** Reinforcement (fiber tape), available either in one package or separately.

PERF-A-TAPE Reinforcement is a strong fiber tape specially designed with chamfered edges feathered thin. Special cross-fibered paper has great strength both with and across the grain of paper. Many small random perforations allow rapid air escape during embedding. Highly crack resistant. **Uses:** outstanding performance when used with companion products for joint reinforcement on gypsum wallboards—either **PERF-A-TAPE** Joint Compound, **PERF-A-TAPE** All Purpose Ready-Mixed Compound, or **DURABOND** One-Day Joint System.

PERF-A-TAPE Joint Compound is the standard of excellence among products used primarily for embedding tape, and the most widely used of all joint treatment preparations. Supplied in powder form, it has superior qualities of tight bonding, easy

mixing, smooth working, edge and check crack resistance, outstanding durability. Special formula minimizes paint discoloration and discoloration from most vapors and gas burner gases in air; no priming necessary with paints which have good resistance to suction differences. **Uses:** for hand or mechanical application on interior joints, corners and fastener heads; should be followed by **PERF-A-TAPE** Topping Compound for finishing. Also used as laminating compound; requires supplemental fastening.

PERF-A-TAPE All Purpose Ready-Mixed Compound is widely used because it produces uniform job results. Comes pre-mixed, hence not subject to variation in mixture. It has a creamy, lump-free plasticity that produces excellent slip and bond, extra-smooth embedding and finishing—latest improvement in an all-purpose ready-mixed product. Requires minimum sanding, eliminates contamination resulting from dirty or impure water. Available in either machine or hand tool consistency; supplied either separately or with **PERF-A-TAPE** Reinforcement as part of Ready-Mixed System. On-the-wall cost averages the same as with powder compounds. **Uses:** excellent for embedding tape, smooth finished joints, finishing metal trim, nailhead spotting. **Limitations:** container must be protected from freezing; not recommended for laminating in double-layer application of wallboard.

PERF-A-TAPE Topping Compound is the companion product used for finishing over **PERF-A-TAPE** Joint Compound. Preferred for its workability, smoothness and paintability; has fine texture and long working life. Latest improvements provide better slip and feathering, reduced shrinkage, easier sanding, superior bonding even under poor drying conditions. Has no "built in" factors to contribute to discoloration of paint from vapors or gases. Supplied in powder form, pigmented or unpigmented. **Uses:** for fine finishing of joints in second and third coat work; also for nailhead concealment. **Limitation:** not recommended for use in embedding.

PERF-A-TAPE Ready-Mixed Topping Compound, a new product, combines the exacting high quality standards of a pre-mixed product with the fine texture, creamy consistency, low shrinkage, better slip and feathering properties required for fine finishing of joints. **Uses:** as a finishing coat over all joint compounds or in concealing nailheads. Not required when **PERF-A-TAPE** All Purpose Ready-Mix Compound is used for embedding and finishing. **Limitation:** protect container from freezing.

DURABOND One-Day Joint Compound is the newest U.S.G. development for faster finishing of gypsum drywall interiors and where early occupancy are important. A powder product mixed with water, it chemically hardens in 3 to 4 hours, thus permits same-day finishing with **DURABOND** Topping Coat or **PERF-A-TAPE** Ready-Mixed Compound and usually next-day decoration. Reduces mixing and clean-up time to result in lower applied costs than most competitive one-day compounds—also produces better bond and appreciably lower shrinkage. Suitable for hand or mechanical application; edge and check crack resistant. Faster

hardening formulation also available. **Uses:** for embedding PERF-A-TAPE Reinforcement and as first fill or topping coat, also for concealing nailheads or screws. Used directly over DUR-A-BEAD and PERF-A-BEAD Corner Reinforcement. **Limitations:** Not a finishing coat; must be completely covered with DURABOND Topping Coat or PERF-A-TAPE All Purpose Ready-Mixed Joint Compound.

DURABOND Topping Coat is a new powdered vinyl finishing compound developed for use over DURABOND One-Day Joint Compound. Substantially reduces cost of one-day joint systems, normally ready for use immediately after mixing. Easily mixed; exceptionally smooth working simplifies sanding. **Uses:** as final or skim coat over DURABOND Joint Compound. Ideal choice wherever one-day work is required. **Limitations:** Not recommended for embedding. Use only over DURABOND Compound.

USG Cover Coat provides a smooth surface over above grade concrete ceilings and columns where gypsum wallboard is not required. Supplied in ready-mixed form; easily applied with drywall tools. Fill in form joints; apply one or more fill coats and a finish coat; follow with sealer before final decoration is applied. **Limitations:** not recommended for use in areas subjected to continued moisture or prevailing low temperatures.

TABLE VI. Joint Treatment Product Specifications

Product Description	Items per Package	Gross Wt. Lbs./Pkg.
PERF-A-TAPE Joint System 60' tape, 4½ lb. compound* in box 250' tape, 18 lb. compound in bag	10/ctn. 1 bag	55 20
PERF-A-TAPE Ready-Mixed Joint System 100' tape, 1 gal. compound in unit	2/ctn.	30
PERF-A-TAPE Reinforcement 60' rolls 250' rolls 500' rolls	24/ctn. 20/ctn. 10/ctn.	10 28 28
PERF-A-TAPE Joint Compound 32 lb. bag 25 lb. bag 5 lb. box	1 bag 1 bag 10/ctn.	32½ 25½ 55
PERF-A-TAPE Topping Compound DURABOND Joint Compound, and DURABOND Topping Compound 32 lb. bag 25 lb. bag	1 bag 1 bag	32½ 25½
PERF-A-TAPE All Purpose Ready-Mixed Joint Compound 5 gal. carton with plastic bag 5 gal. metal can—no plastic bag 1 gal. metal can—no plastic bag	1 ctn. 1 can 4/ctn.	67 67 58
PERF-A-TAPE Ready-Mixed Topping Compound 5 gal. carton with plastic bag 5 gal. metal can—no plastic bag	1 ctn. 1 can	67 67
USG Cover Coat 5 gal. carton with plastic bag	1 ctn.	67

*Can be furnished without knives or with one plastic knife per box.

SELECTOR GUIDE TO USG PAINT PRODUCTS

INTERIOR WALLS—GYPSUM BOARD		FINISH PRODUCT USED						
Type of Finish Desired	Special Surface Treatment New Work	Description	Thinner	Method Application	Drying Time Touch	Hours Recoat	One Gal. Coverage (Sq. Ft.)	
Velvet	TEXOLITE Primer-Sealer or GRAND PRIZE Paint	GRAND PRIZE Paint	NR/w	B1, R1, S1	½	24	450	
Flat	SHEETROCK Sealer or TEXOLITE Primer-Sealer	TEXOLITE Alkyd Latex	NR/w	R1, S1, B2	½	24	400	
Semi-Gloss	USG Alkyd Enamel Undercoat or TEXOLITE Primer-Sealer	USG Satin-Lustre Enamel, or USG Semi-Gloss Enamel	NR/ms	S1, B1, R2	3	24	450-500	
Gloss	USG Alkyd Enamel Undercoat	USG High-Lustre Enamel	NR/ms	S1, B1, R2	3	24	450	
Multi-colored	None; or TEXOLITE Primer-Sealer	USG Super NEO-FLECK, or TEXOLITE Alkyd Latex with Add-A-Fleck	NR/w	S-Only	½	8	200-225	
Durable Glaze	TEXOLITE Alkyd Latex or GRAND PRIZE Paint	USG Plastic Glaze Primer under USG Plastic Glaze	NR/w SS/USG	B1, R1, S1 B1, R1, S1	½ 2	8 24	Variable 400	
Epoxy Glaze	TEXOLITE Primer-Sealer or USG Epoxy Enamel	USG Epoxy Enamel	SS/USG	S1, B2, R2	—	24	190-220	
Sand Float Texture	As required	USG Texture I	NR/w	B1, R1	½	24	200	
Orange-peel to Ripple Texture	As required	USG Texture II	NR/w	B1, R1, S1	1	24	200	
Heavy Stipple or Period Texture	Usually none	TEXTONE*, then GRAND PRIZE Paint	W	B, R, O	1	12	9-36 (lb.)	
Medium Light to Medium Heavy Texture	Usually none	USG Texture Paint; then GRAND PRIZE Paint (also 2 finishes below)	W	B, R, O	1	12	27-54 (lb.)	
Medium Light to Very Light Texture	Usually none	A-B TEX* or USG Spray Texture	W	B, R, S, O	1	12	27-54 (lb.)	
Sand Finish	None	USG Texture VII	W	S	1	12	20-35 (lb.)	

INTERIOR WOOD TRIM													
Semi-Gloss	USG Alkyd Enamel Undercoat	USG Alkyd Enamel Undercoat	USG Satin-Lustre or Semi-Gloss Enamel	NR/ms	S1, B1, R2	3	24	450-500					
Gloss	USG Alkyd Enamel Undercoat	USG Alkyd Enamel Undercoat	USG High-Lustre Enamel	NR/ms	S1, B2, R2	3	24	450					
Flat	USG Alkyd Enamel Undercoat	None-dull gloss	TEXOLITE Alkyd Latex, GRAND PRIZE Paint	See Above	See Above	See Above	See Above	See Above	See Above	See Above	See Above	See Above	
INTERIOR METAL TRIM													
Flat (Water Thinned)	Rust Inhibitive Primer	None, if free of rust	TEXOLITE Alkyd Latex, GRAND PRIZE Paint	See Above	See Above	See Above	See Above	See Above	See Above	See Above	See Above	See Above	
Gloss (Solvent Thinned)	Rust Inhibitive Primer	None, if free of rust	USG Satin-Lustre or USG High-Lustre Enamel	See Above	See Above	See Above	See Above	See Above	See Above	See Above	See Above	See Above	
INTERIOR CEILINGS—GYPSUM BOARD													
Flat (Low Scrub)	None	None	TEXOLITE Standard Paint	NR/w	B1, R1, S1	½	24	350					
Flat (Med. Scrub)	None, or TEXOLITE Primer-Sealer	None	USG Super Ceiling White	NR/w	B1, R1, S2	½	8	250					
Flat (High Scrub)	TEXOLITE Primer-Sealer or GRAND PRIZE Latex	GRAND PRIZE LATEX Wall Paint	GRAND PRIZE Paint	NR/w	B1, R1, S1	½	8	450					
Textured	USG Texture I, II, or VII	Any of above finishes for wallboard											
Rough Texture	None (Smooth with Ready-Mixed Compd.)	USG Imperial QT Spray Texture Paint											
EXTERIOR SOFFITS—GYPSUM BOARD													
Low Sheen	2-Coats, for old light chalk surface—clean, dust-free, wire brush off chalk prior to painting	USG Vinyl Exterior Paint	NR/w	B1, R1, S1	½	8	350						
Medium Lustre		USG Latex House Paint	NR/w	B1, R1, S1	½	8	350						

NOTES: "Drying Time" and "Coverage" estimates are based on average conditions. "Touch" = furniture can be returned to living areas. Abbreviations, Method of Application: B = brush, R = roller, S = spray, T = trowel, O = other; 1,2,3 = order of preference. Thinners: NR/w—Not recommended, use water sparingly; NR/ms—Not recommended, use mineral spirits if needed; SS/USG—Special Solvent manufactured by U.S. Gypsum; W—water per directions.



/METHODS OF INSTALLATION

GYPSUM DRYWALL CONSTRUCTION

CHAPTER

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Types of Application

SHEETROCK Wallboard provides a variety of durable, fire-resistant easily decorated surfacing materials for interior walls, ceilings, and partitions. SHEETROCK may be applied in one or two layers directly to wood framing members, to metal studs or channels or to gypsum studs, ribs or backing boards.

Single Layer Application—This basic construction is used to surface interior walls and ceilings not exposed to extreme or continuous moisture, where economy, fast erection, and fire resistance are required. It is equally suitable for remodeling, altering and resurfacing cracked and defaced areas; also usable for open porch and carport ceilings and soffits of eaves and rakes when the construction protects the SHEETROCK Wallboard from direct contact with water.

Double Layer Application—Consists of a face layer of SHEETROCK job-laminated to a base layer of gypsum, wood fiber or mineral fiber board that is directly attached to framing members. This construction offers greater strength and higher resistance to fire and sound transmission. Walls and ceilings so constructed are highly resistant to cracking, easy to decorate. They minimize the possibility of fastener "pops" and discoloration over fastener heads.

Fastening Methods—Wallboard is applied by several alternate methods depending on the type of supports and materials used:

1. **Single Nailing**—conventional attachment for wood framing.
2. **Double Nailing**—for minimizing defects due to loosely nailed wallboard.
3. **Adhesive Nail-on**—continuous bead of SHEETROCK Brand DWA-14 or DWA-10 Adhesive applied to wood framing plus supplemental nailing; improves bond strength, greatly reduces face nailing needed.
4. **Screw Attachment**—USG Drywall Screws are the best known insurance against fastener pops caused by loosely attached board. Recommended in wood frame application; required with drywall systems employing metal framing.
5. **Adhesive Attachment**—the latest advancement for producing the finest room interiors. Usually requires only supplemental fasteners to attach face layers to gypsum studs, ribs or backing boards. Reduced nail or screw fastening required saves spotting and sanding labor; minimizes nail pops and joint ridging.

Planning the Job

Advanced planning by the drywall applicator can mean savings in time and material cost and a better appearing job. Proper planning will result in the most effective use of material, the elimination of unnecessary joints, and the location of required joints at the least conspicuous places. Try to span the whole wall or ceiling from corner to corner with one sheet of wallboard. Use the longest practical lengths obtainable. This will keep butt joints to a minimum. End joints, when they occur, should be staggered.

In double layer construction, joints occurring in the face layer are offset at least 10" from parallel joints in the base layer. The layout of the base layer must be planned to account for this offset and still provide optimum joint finishing conditions and efficient use of materials in the face layer as mentioned above.

HORIZONTAL VS. VERTICAL APPLICATION



SHEETROCK Wallboard may be applied horizontally (long edges of the board at right angles to the framing) or vertically (long edges parallel to framing). Fire rated partitions generally require vertical application.

Horizontal application is generally better because it offers the following advantages:

1. Reduces lineal footage of joint treatment up to 25%.
2. Strongest dimension of board runs across framing members.
3. Bridges irregularities in alignment and spacing of framing members.
4. Better bracing continuity—each panel ties more framing members together.
5. Joints on walls are at a convenient height for the finishing operation with **PERF-A-TAPE** Joint System.

For wall application, if ceiling height is 8'2" or less, horizontal layout of SHEETROCK panels will result in fewer joints, easier handling, and less cutting. If ceiling height is greater than 8'2" or wall is 4' wide or less, vertical application will be more practical. For ceiling application, use whichever method will result in fewer joints.

In double layer construction on ceilings, apply base layer boards horizontally, at right angles to framing members; apply face layer either vertically or horizontally with joints offset. On walls apply base layer boards vertically with edges centered on framing members; apply face layer horizontally. **Exception:** When using SHEETROCK predecorated wallboard or ULTRAWALL Panels for face layer on walls, apply base layer horizontally at right angles to studs.

FRAMING MEMBER SPACING

SHEETROCK may be applied directly over wood studs, joists and rafters, or assembled with metal and gypsum components into systems that provide excellent sound and fire resistant construction.

Maximum spacings for wood framing members to receive SHEETROCK wallboard are shown in the tables below. Spacings for systems components are shown in the descriptions of the various systems, Chapter 4.

Wallboard Thickness	Location	Application Method	Maximum Spacing Framing Members
Single Layer Application			
$\frac{3}{8}$ "	Ceilings	Horizontal	16" o.c.
$\frac{3}{8}$ "	Sidewalls	Horizontal or Vertical	16" o.c.
$\frac{1}{2}$ "	Ceilings	Vertical	16" o.c.
$\frac{1}{2}$ "	Sidewalls	Horizontal	24" o.c.
$\frac{5}{8}$ "	Ceilings	Horizontal or Vertical	24" o.c.
$\frac{5}{8}$ "	Sidewalls	Vertical	16" o.c.
$\frac{5}{8}$ "	Sidewalls	Horizontal	24" o.c.
$\frac{5}{8}$ "	Sidewalls	Vertical or Horizontal	24" o.c.
Double Layer Application			
$\frac{3}{8}$ "	Ceilings	Horizontal	16" o.c.
$\frac{3}{8}$ "	Sidewalls	Horizontal or Vertical	24" o.c.
$\frac{1}{2}" \& \frac{5}{8}"$	Sidewalls	Horizontal	24" o.c.
$\frac{1}{2}" \& \frac{5}{8}"$	Ceilings	Horizontal or Vertical	24" o.c.

Notes: 1. Where adhesive is not used between layers, limitations of framing member spacing of single layer construction apply to both base and face layers.
 2. Up to 6" of wool insulation may be applied resting on SHEETROCK Wallboard ceilings, provided the maximum spacing of framing members is not exceeded and the joints are taped.

WOOD FRAMING REQUIREMENTS

Wood framing meeting the following minimum requirements is necessary for proper performance of all gypsum wallboard fasteners:

1. Framework should meet the minimum requirements of FHA and local building codes.

2. Framing members should be straight, true, of uniform dimension. Studs and joists must be in true alignment; bridging, fire stops, soil pipes, etc., must not protrude beyond framing.
3. All framing lumber should be of a good grade for the intended use, and 2"x4" nominal size or larger should bear the grade mark of a recognized inspection agency using grading rules for lumber recommended to American Lumber Standards Committee.
4. All framing lumber should have a moisture content not in excess of 15% at time of gypsum wallboard applications.
5. Do not attach gypsum wallboard to extremely soft framing members.

Failure to observe these minimum framing requirements, which are applicable to screw, nail and adhesive attachment, will materially increase the possibility of fastener failure due to warping or dimensional changes. This is particularly true if framing lumber has greater than normal tendencies to warp or shrink after erection.

Framing should approach as closely as possible the moisture content it will reach in service by allowing the building, after it is enclosed, to stand as long as possible prior to the application of the gypsum wallboard. Provide heat in winter or during damp conditions at a uniform temperature in the range of 55° to 70°F. Provide ventilation to remove excess moisture.

ESTIMATING MATERIALS

Wallboard—From practical experience professional estimators have developed many methods of determining footage required to complete various types of jobs. Basically, these methods stem from the simple principle of "scaling a plan," and determining the length and width and ceiling height of each room on the plan. Frequently, door and window openings are "figured solid" with no openings considered. Exceptions may be large picture windows and large door openings. From these dimensions the estimator determines the square footage of each room. The footage of each room is added to determine total footage required. From these figures, the lengths of gypsum wallboard needed may be determined.

Plan to use the longest practical length of SHEETROCK wallboard that will span the ceiling and wall area. This will reduce butt joints to a minimum or eliminate them entirely. When estimating walls adjacent to sloping ceilings, plan carefully so that there will be a minimum of waste. Refer to Chapter 2—Products—Tables I and II for available lengths of each type wallboard.

For the convenience of the drywall applicator, the Rapid Room Measure Table shown on the next page gives the total area in sq. ft. (4 walls and the ceiling) of rectangular rooms with 8' ceiling heights. For net footage deduct openings.

RAPID ROOM MEASURE TABLE*
COMPUTATIONS FOR 8' CEILING HEIGHTS. THIS TABLE FOR SQUARE FEET SOLID MEASURE
(For Net Footage Deduct Openings)

	2' 2" 6"	3'	4'	5'	6'	7'	8'	9'	10' 1"	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'		
2'	68	77	86	104	122	140	158	176	194	212	230	248	266	284	302	320	338	356	374	392	410	428	446	464	482	500	518	536	554	572	2'
2' 6"	77	86.3	95.5	114	132.5	151	169.5	188	206.5	225	243.5	262	280.5	299	317.5	336	354.5	373	391.5	410	428.5	447	465.5	484	502.5	521	539.5	558	576.5	595	2' 6"
3'	86	95.5	105	124	143	162	181	200	219	238	257	276	295	314	333	352	371	390	409	428	447	466	485	504	523	542	561	580	599	618	3'
4'	104	114	124	144	164	184	204	224	244	264	284	304	324	344	364	384	404	424	444	464	484	504	524	544	564	584	604	624	644	664	4"
5'	122	132.5	143	164	185	206	227	248	269	290	311	332	353	374	395	416	437	458	479	500	521	542	563	584	605	626	647	668	689	710	5'
6'	140	151	162	184	206	228	250	272	294	316	338	360	382	404	426	448	470	492	514	536	558	580	602	624	646	668	690	712	734	756	6"
7'	158	169.5	181	204	227	250	273	296	319	342	365	388	411	434	457	480	503	526	549	572	595	618	641	664	687	710	733	756	779	802	7"
8'	176	188	200	224	248	272	296	320	344	368	392	416	440	464	488	512	536	560	584	608	632	656	680	704	728	752	776	800	824	848	8"
9'	194	206.5	219	24	269	294	319	344	369	394	419	444	469	494	519	544	569	594	619	644	669	694	719	744	769	794	819	844	869	894	9"
10'	212	225	238	264	290	316	342	368	394	420	446	472	498	524	550	576	602	628	654	680	706	732	758	784	810	836	862	888	914	940	10"
11'	230	243.5	257	284	311	338	365	392	419	446	473	500	527	554	581	608	635	662	689	716	743	770	797	824	851	878	905	932	959	986	11"
12'	248	262	276	304	332	360	388	416	444	472	500	528	556	584	612	640	668	696	724	752	780	808	836	864	892	920	948	976	1004	1032	12"
13'	266	280.5	295	324	353	382	411	440	469	498	527	556	585	614	643	672	701	730	759	788	817	846	875	904	933	962	991	1020	1049	1078	13"
14'	284	299	314	344	374	404	434	464	494	524	554	584	614	644	674	704	734	764	794	824	854	884	914	944	974	1004	1034	1064	1094	1124	14"
15'	302	317.5	333	364	395	426	457	488	519	550	581	612	643	674	705	736	767	798	829	860	891	922	953	984	1015	1046	1077	1108	1139	1170	15"
16'	320	336	352	384	416	448	480	512	544	576	608	640	672	704	736	768	800	832	864	896	928	960	992	1024	1056	1088	1120	1152	1184	1216	16"
17'	340	354.5	371	404	437	470	503	536	569	602	635	668	701	734	767	800	833	866	899	932	965	998	1031	1064	1097	1130	1163	1196	1229	1262	17"
18'	356	373	394	424	458	492	526	560	594	628	662	696	730	764	798	832	866	900	934	968	1002	1036	1070	1104	1138	1172	1206	1240	1274	1308	18"
19'	374	391.5	409	444	479	514	549	584	619	654	689	724	759	794	829	864	899	934	969	1004	1039	1074	1109	1144	1179	1214	1249	1284	1319	1354	19"
20'	392	410	428	464	500	536	572	608	644	680	716	752	788	824	860	896	932	968	1004	1040	1076	1112	1148	1184	1220	1256	1292	1328	1364	1400	20"
21'	410	428.5	447	484	521	558	595	632	669	706	743	780	817	854	891	928	965	1005	1042	1079	1113	1150	1187	1224	1261	1298	1335	1372	1409	1446	21"
22'	428	447	466	504	542	580	618	656	694	732	770	808	846	884	922	960	998	1036	1074	1112	1150	1188	1226	1264	1302	1340	1378	1416	1454	1492	22"
23'	446	465.5	485	524	563	602	641	680	719	758	797	836	875	914	953	992	1031	1070	1109	1148	1187	1226	1265	1304	1343	1382	1421	1460	1499	1538	23"
24'	464	484	504	544	584	624	664	704	744	784	824	864	904	944	984	1024	1064	1104	1144	1184	1224	1264	1304	1344	1384	1424	1464	1504	1544	1584	24"

*For rectangular rooms with 8' ceiling height—no openings.

Joint Treatment—Use the following table when determining the quantities of joint treatment products needed for each job:

**Estimator for PERF-A-TAPE Joint System Products
(Tape and Compound Separate)**

With This Amount of SHEETROCK Gypsum Wallboard	Use This Amount of Compound	Or—This Amount of Ready-Mixed Compound	And This Amount of Tape
100 sq. ft.	1 Box	1 Gal.	1—60' roll
200 sq. ft.	2 Boxes	1 Gal.	2—60' rolls
300 sq. ft.	3 Boxes	2 Gals.	2—60' rolls
400 sq. ft.	4 Boxes	2 Gals.	3—60' rolls
500 sq. ft.	1 Bag	3 Gals.	3—60' rolls
600 sq. ft.	1 Bag and 1 Box	3 Gals.	1—250' roll
700 sq. ft.	1 Bag and 2 Boxes	4 Gals.	1—250' roll
800 sq. ft.	1 Bag and 3 Boxes	4 Gals.	1—250' roll & 1—60' roll
900 sq. ft.	2 Bags	1—5 Gal. Drum	1—250' roll & 1—60' roll
1000 sq. ft.	2 Bags	1—5 Gal. Drum	1—250' roll & 2—60' rolls

CONTENTS: Box—5 lbs. Compound only; Bag—25 lbs. Compound only. Note: Compound also supplied in 32 lb. bags.

For applying DURABOND Joint System, approximately 50 lbs. of joint compound and 370 ft. of PERF-A-TAPE reinforcing are required to finish 1000 sq. ft. of SHEETROCK Gypsum Wallboard.

Screws—For applying single layer SHEETROCK Wallboard to wood framing approximately 1100 ea. of 1½" USG Drywall Screws—Type W are required per M sq. ft. of wallboard.

Fastener usage for other assemblies varies with the construction and spacing and is shown in the descriptions of various systems, Chapter 4.

Nails—Usage for nails is shown in the Selector Guide for Wallboard Nails, Chapter 2.

Caulking—The approximate lineal footage of caulking bead per gallon of PRESSTITE 579.64 caulking is: 375 to 400 for ¼" bead, 150 for ⅜" bead, 110 to 120 for ½" bead.

Adhesive—The following table shows the amount of adhesive needed per 1,000 sq. ft. of laminated wallboard surface:

Product	Approx. Quantity per M Sq. Ft.
SHEETROCK Brand Adhesive	
DWA-10	2½ gals.
DWA-14	2 gals.
PERF-A-TAPE Joint Compound (embedding type)	55 to 60 lbs. (A)
USG Laminating Adhesive	50 lbs. (A)

(A) Quantity shown is for sheet lamination. Estimate one-half this amount for strip lamination.



Application Recommendations

SCREW APPLICATION

USG Drywall Screws are applied with a positive-clutch electric power tool, commonly called an electric screwdriver, equipped with adjustable screw depth control head and a Phillips bit. The use of screws provides a positive mechanical attachment of wallboard to wood and metal framing with fewer fasteners and less spotting. Here is shown correct use of electric screwdriver:

Set Screwdriver—Set adjustment for proper screw depth on scrap wallboard and framing. Screw head must be driven slightly below face of board but not deep enough to break the paper. To adjust, grasp control head firmly with one hand and loosen control head lock bushing with the other. Rotate control head to provide proper screw depth. When proper adjustment has been made, positively secure control head to maintain adjustment.

Place Screw—Magnetic tip holds drywall screw for driving. Bit tip does not rotate until pressure is applied to wallboard during application.

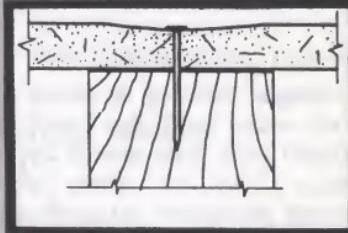
Enter Screw Straight—Firm hand grip on electric screwdriver is important for straight line of entry. Screw must enter perpendicular to board face for proper performance. Drive screws at least $\frac{3}{8}$ " from ends or edges of wallboard to provide a uniform dimple not over $\frac{1}{32}$ " deep.

Operate electric screwdriver constantly during usage. When screw head is driven solidly against wallboard, screwdriver head will automatically stop turning and a positive clutch will disengage drive head. Remove screwdriver instantly or the motor will re-engage and chew up screw head or force it below surface of wallboard. The electric screwdriver technique is relatively simple and a proficiency with the tool can be developed after a few hours' use.

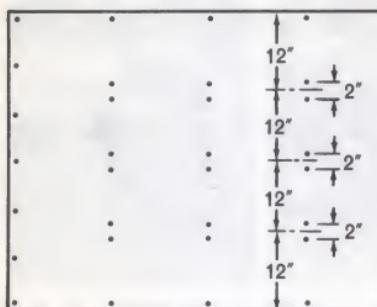
NAIL APPLICATION

1. Drive nails at least $\frac{3}{8}$ " from ends or edges of SHEETROCK wallboard.
2. Position nails on adjacent ends or edges opposite each other.
3. Begin nailing from *center* of wallboard and proceed toward outer ends or edges.
4. When nailing, apply pressure on wallboard adjacent to nail being driven to insure that wallboard is secured tightly on framing member.
5. Drive nails with shank perpendicular to face of board.
6. Use a WAL-BOARD hammer or crowned-head hammer.
7. With last blow of hammer, seat nail so head is in a slight uniform dimple formed by last blow of hammer.

Do not break paper at nail head or around circumference of dimple by over-driving. A nail set should not be used. Maximum depth of dimple should not exceed $1/32"$.



DOUBLE NAILING APPLICATION



In the double nailing method for attaching wallboard to wood framing, space the first nails 12" o.c. along the supports in the field of the board. Drive second nails about 2" from the first. Use single nails around the board perimeter (see drawing).

This application method helps prevent loose board and resultant nail pops that may occur when wallboard is not applied correctly and pushed tight against the framing. This method will not reduce the incidence or severity of nail pops due to wood shrinkage. (See Chapter 6 for data on lumber shrinkage.)

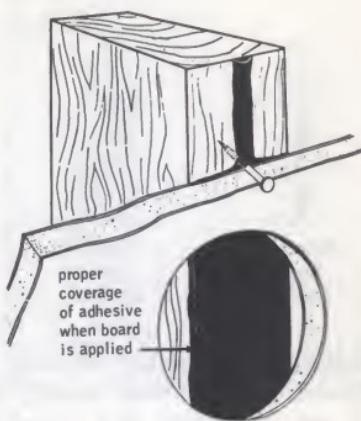
INSTALLATION

Ceilings: Starting in center of board and working toward edges and ends, hold the board tight against the ceiling joists and attach with nails spaced approximately 12" o.c. Drive secondary nails 2" to 2½" from first nails. Use single nails around the board perimeter. At ends space nails no more than 7" o.c.

Sidewalls: Illustration shows the correct double nailing procedure for sidewall application. Attach first board to top plate by driving single edge nails at points A, B, C, etc. Hold board tight against studs and apply nails in field of board in the number sequence indicated. Drive second nails within 2" to 2½" of the first. Use single nails around the board perimeter. Space end nails no more than 8" o.c.

Note: After second nails are applied, it may be necessary to restrike and drive home first nails which appear loose and do not hold wallboard tight. Check all nails for proper dimple.

ADHESIVE NAIL-ON APPLICATION



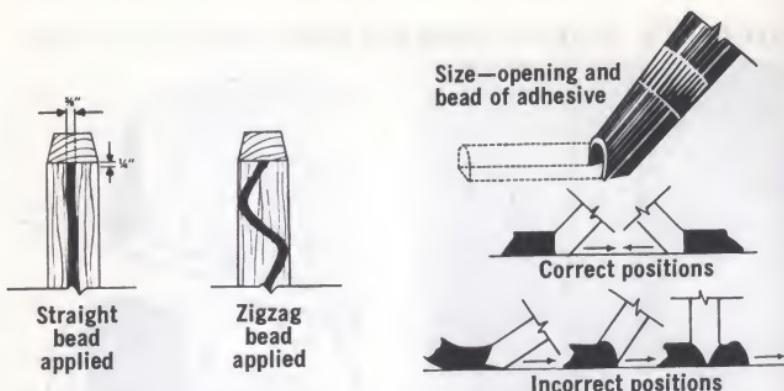
In the adhesive nail-on method a continuous bead of SHEETROCK Brand DWA-14 or DWA-10 Adhesive is applied to the face of wood framing with a cartridge gun. Gypsum wallboard is applied and attached with only a minimum number of supplementary fasteners compared to conventional fastening methods (see next page for fastener spacing required). Spacing of framing members is the same as that used for conventional attachment. DWA-14 Adhesive is not to be used with Insulating (foil-back) SHEETROCK Wallboard; use DWA-10. Advantages of method:

- Reduces up to 66% of the fasteners that cause most of the problems.
- Stronger than conventional nail application—
 - Up to 100% more tensile strength.
 - Up to 50% more shear strength.
- Unaffected by moisture, high or low temperature; vermin-resistant.
- Reduces loose board caused by improper fastening.
- Bridges minor framing irregularities.
- Will not stain or bleed through most finishes.

INSTALLATION

All surfaces to receive adhesive should be free of dirt, grease, oil or other foreign material. To facilitate flow, store adhesive at approximately 70°F. for 24 hours prior to use. The adhesive should be kept in the original unopened container prior to use, or enclosed to prevent evaporation of volatile materials. Unused portions remaining in can should be resealed or covered with a film of water to retard evaporation of thinners. Remove water before reusing.

Adequate ventilation should be provided during use to remove fumes emitted from the volatile agents in the adhesive. Normal precautions (for a flammable material) should be employed regarding proximity to fire, sparks or smoking before volatile materials are evaporated.



Adhesive is applied with a Drywall Adhesive Applicator—Model A-3 for bulk loading from 5 gal. cans, Model A-2 for $\frac{1}{4}$ gal. cartridges. For description of tools, see Chapter 7; for adhesives, Chapter 2.

Proper nozzle opening and gun position (see sketch) are required to obtain the right size and shape of bead for satisfactory results. Initial height of bead over framing should be $\frac{3}{8}$ " and of sufficient volume to provide $1/16$ " thickness of adhesive over the entire support.

Apply adhesive in a continuous $\frac{3}{8}$ " bead in the center of the attachment face and to within 6" of the ends of all framing members. Where two pieces of wallboard meet on a framing member, apply a serpentine or zigzag bead with an 8" repeat pattern permitting adhesive to contact both panels. Do not apply adhesive to members such as bridging, diagonal bracing, etc. into which no supplemental fasteners will be driven. Adhesive is not required at inside corners, top and bottom plates, bracing or fire stops and is not ordinarily used in closets.

Place wallboard shortly after adhesive bead is applied and fasten immediately, using proper screw or nail. After board has been applied, impact by hand along each stud or joist to insure good contact at all points.

To insure a good bond, no more DWA-10 Adhesive should be applied than can be covered in 15 minutes; no more DWA-14 Adhesive than can be covered in 45 minutes. If adhesive is left exposed to the air for longer periods, the volatile materials will evaporate causing surface hardness that prevents a full bond.

Fastener Spacing—SHEETROCK Brand DWA-10 Adhesive

Frame Spacing o.c.	Ceilings		Partitions Load Bearing		Partitions Non-Load Bearing	
	Nail	USG Screw Type W	Nail	USG Screw Type W	Nail	USG Screw Type W
16"	16"	16"	16"	24"	24"	24"
24"	12"	16"	12"	16"	16"	24"



Fastener Spacing—SHEETROCK Brand DWA-14 Adhesive

Ceilings—Horizontal Application: Fasten at each framing intersection and 16" o.c. at each board end. One temporary field fastener per framing member required at mid-width of board.

Ceilings—Vertical Application: Space fasteners 16" o.c. along board edges and at each framing intersection on ends. Space fasteners 24" o.c. on intermediate supports.

Walls—Horizontal Application: Same as Ceilings—Horizontal Application above, except that no field fasteners are required.

Walls—Vertical Application: Same as Ceilings—Vertical Application above, except that no fasteners are required on intermediate supports. Where fasteners at the vertical joints of the panel are objectionable, prebow the gypsum wallboard and apply fasteners 16" o.c. only at the top and bottom of the panel. Prebowing not recommended for predecorated panels.

Remove excessive adhesive from the surface of the wallboard (except predecorated boards), exposed finished surfaces and tools with naphtha, white gasoline or kerosene.

Allow adhesive to dry at least 24 hours before applying joint treatment.



ADHESIVE APPLICATION—MULTI-LAYER

In adhesive application, SHEETROCK Wallboard or predecorated ULTRAWALL or SHEETROCK Vinyl Panel face layers are job-laminated to a base layer of gypsum boards, gypsum studs or ribs or sound deadening boards.

Attachment of the face layer to the base layer is by either of two products: (a) USG Laminating Adhesive or (b) PERF-A-TAPE Joint Compound (embedding type). Both adhesives require temporary support or supplemental fastening while drying; provide a tight bond; permit leveling and adjustment of boards after contact; and are used generally in fire and sound-rated construction.

When base layer is sound deadening board, the face layer of gypsum wallboard is attached using permanent face layer fasteners top and bottom of panel. Permanent face nailing in field of panel is required for a fire rating. For details on fire ratings, see Chapter 5; for construction data and applicable laminating procedure, see pertinent USG system, Chapter 4.

INSTALLATION-USG LAMINATING ADHESIVE OR PERF-A-TAPE JOINT COMPOUND (used as a laminating adhesive)

Directions for Mixing

- Mix PERF-A-TAPE Joint Compound and USG Laminating Adhesive in a clean metal container, using a sturdy mixing paddle (see Chapter 7—Tools).
- Use clean, drinkable water for mixing; lukewarm (not hot) water for PERF-A-TAPE Joint Compound, cool water for USG Laminating Adhesive in quantities shown below:
- Pour all water into a container of suitable size, then sift powder into the water, stirring continuously.
- Mix for approximately 1½ minutes, to make sure all compound is uniformly damp and mixture is smooth.
- Allow mix to stand for a 30 minute soaking period. After this, USG Laminating Adhesive is ready to use. PERF-A-TAPE Compound should be stirred vigorously for approximately one minute to break down any lumps before use.
- The consistency of adhesive can be adjusted by adding small amounts of powder or water. Wet mix may be held for up to 24 hours by covering with a small amount of water.

- **PERF-A-TAPE** Joint Compound and USG Laminating Adhesive should be used separately and should not be mixed together or with any other material.

Application—Face Layer—With USG Laminating Adhesive or **PERF-A-TAPE** Joint Compound (embedding type), the face layers are attached by spreading the adhesive over the entire surface of the wallboard sheet, **sheet lamination**, or by applying the adhesive in vertical strips, **strip lamination**.

Sheet Lamination is suitable for horizontal or vertical application of wallboard on walls and ceilings where the entire back surface of the face layer comes into contact with the base layer.

Precut and prefit face panels as required and apply adhesive in beads approximately $\frac{3}{8}$ " wide at the base and $\frac{1}{2}$ " high and spaced $1\frac{1}{2}$ " to 2" o.c. with an Ames laminating spreader or with a notched metal spreader blade. Spread adhesive uniformly over the entire back surface of the face panel to the extreme edges of the board. Laminate face layer to base layer using moderate pressure and temporary nails, temporary supports, or USG Drywall Screws Type G (see below for application details). Wipe off any adhesive forced out at edges. After laminating compound has thoroughly dried (usually 24 to 48 hours), remove temporary nails and shoring.

In horizontal application, face layer and joints may occur on or between framing members. When end joints occur between framing members, follow back-blocking surface alignment procedure (see details this chapter), using wood supporting strips to assure alignment.

1. Temporary Nailing—Use nails that have at least $\frac{3}{4}$ " penetration into the framing to provide support for the face layer every 16" to 24". A double headed scaffold nail to which large fiber or wood washers are applied, stucco furring nails, or 6d cooler type nails backed up by gypsum board blocks (used as washers) may be used.

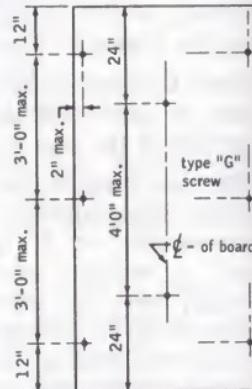
Where nails without gypsum blocks are used, place a thin wood block under claw hammer head when pulling nails to prevent damage to face layer. Properly dimple nail holes before applying joint treatment.

2. Temporary Supports—Provide temporary bracing or shoring that gives support to the face layer every 16" to 24".

3. USG Drywall Screws—Permanently attach face boards with $1\frac{1}{2}$ " USG Drywall Screws Type G. Using screws assures positive attachment while the adhesive dries and provides flush even face layer joints often not provided by temporary nailing. The $1\frac{1}{2}$ " Type G screw is not intended for use with $\frac{3}{8}$ " double wall or a combination of $\frac{1}{2}$ " and $\frac{3}{8}$ " double wall construction or with sound deadening board base layers.

Apply adhesive just prior to face panel erection in order not to wet the base layer and reduce holding power of the screw. Press face layer firmly against base layer with one hand when driving screw. Adhesive should be thin enough to flow and level out as screw is driven.

Place screws along vertical edges and in the field of the board as follows: (a) space screws along vertical edges within 2" of the joint, no further than 12" from either end and no more than 36" o.c.; (b) space screws in the field of the board along the centerline of panel, within 24" of either end and no more than 48" o.c. (see detail below).



Strip Lamination is suitable for vertical application of face layer panels on walls, significantly reduces the amount of adhesive used, and simplifies attachment of the face layer. When used with supplemental Type G drywall screws, strip lamination provides flush even edge joints and positive attachment when the adhesive is drying that is superior to temporary nailing. This method is recommended when a high degree of sound control is required. It is not intended for use on ceilings or for horizontal application of face layers.

Precut and prefit face panels as required and apply adhesive in vertical strips, 24" o.c. to base layer or coreboard. Each strip should consist of four beads approximately $\frac{3}{8}$ " wide at the base and $\frac{1}{2}$ " high spaced $1\frac{1}{2}$ " to 2" o.c. The adhesive is applied most easily with a 7" or 10" Ames laminating head. Permanently attach face boards to base layer or core units with $1\frac{1}{2}$ " USG Drywall Screws Type G located so they penetrate the adhesive strips (see description above for installation of Type G drywall screws).



Application Methods



SINGLE LAYER APPLICATION

The following procedures apply to the installation of single layer SHEETROCK Wallboard to conventional wood framing in residential construction. The fastening may be any one of several attachment methods (see page 58 for details); however, the USG Drywall Screw Type W, designed specifically for this use, virtually eliminates loose attachment of gypsum boards. For recommended thickness of wallboard, method of application (horizontal or vertical) and spacing of framing, refer to Planning the Job, page 59. For complete information on fire and sound resistant assemblies, refer to Chapter 5.

Apply gypsum wallboard so the ends and edges occur over framing members, except when joints are at right angles to the framing members as in horizontal application or when the end joints are to be back-blocked (see page 76). To minimize end joints, use wallboard of maximum practical lengths. When end joints occur, they should be staggered. Joints on opposite sides of a partition should be so arranged as to occur on different studs.

SHEETROCK Wallboard should be applied first to the ceiling and then to the walls. If Insulating SHEETROCK Wallboard is used, apply with foil side against framing. Adjacent boards should be brought into contact but should not be forced into place. Abutting ends and edges and holes for pipes and electrical fixtures should be accurately cut and neatly fitted.

Usually two men are required to work on a ceiling. Fasten wallboard with screws or nails starting from the center of wallboard and working toward the ends and edges. While fasteners are being driven, the wallboard should be held in firm contact with the underlying support. When single fasteners are used, attach wallboard to framing with screws spaced not to exceed 12" o.c. or with nails spaced not to exceed 7" o.c. Drive

fasteners at least $\frac{3}{8}$ " from edges and ends of wallboard to provide a uniform dimple not over $1/32$ " deep.

Apply wallboard to the sidewalls after the ceilings are erected. Where horizontal construction is used on walls, top wall panel is applied first and butted against ceiling. When vertical application is used, sidewall should be spanned from ceiling to floor by single length of SHEETROCK Wallboard.

Vertical application should be used where ceiling height is over 8'2" or where this method results in less waste and less joint treatment.

On sidewalls, maximum fastener spacing for screws is 16" o.c. for framing spaced 16" o.c., 12" o.c. for framing spaced 24" o.c. For nails, maximum spacing is 8" o.c.

Where openings occur, use SHEETROCK Wallboard of sufficient length to span wall areas, covering the openings. If joints occur near an opening, however, the wallboard should be applied so vertical joints are centered, if possible, over door opening. No vertical joints, at any rate, should occur within 8" of external corners of windows, doors, or similar openings except at interior or exterior angles within the room. Door and window openings can be cut out after SHEETROCK is applied.

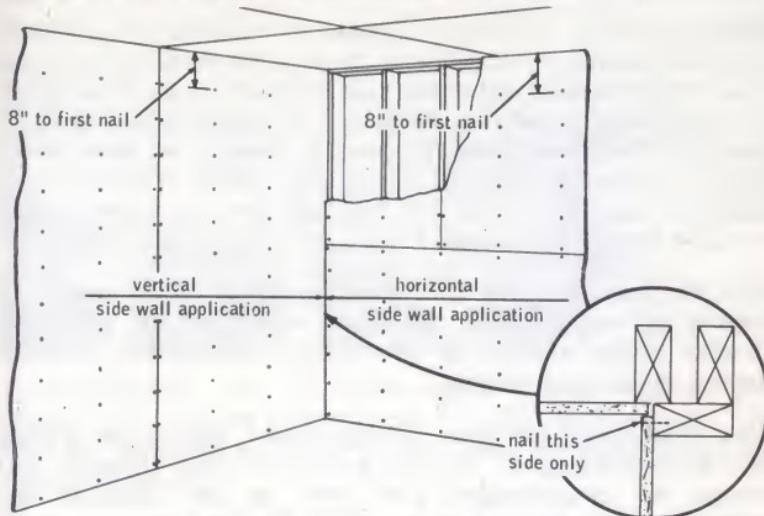
After installation, pound on walls and ceilings to detect loose nails or screws, and push on board adjacent to fasteners to see if there is movement. If loose fasteners are detected, drive them tight. Whenever nails or screws have punctured paper, hold board tight against framing and install another fastener properly, approximately $1\frac{1}{2}$ " from screw or nailhead which punctured paper and remove the faulty fastener. When nailing wallboard to second side of a partition, check opposite side for fasteners loosened by pounding and drive them tight again.

WOOD FURRING

Apply SHEETROCK Wallboard to wood furring strips as follows: Furring strips over wood framing must be 2"x2" (nominal) minimum size. Where SHEETROCK is applied parallel to furring strips securely attached to masonry walls, furring strips should be 2"x3" or 1"x3" (nominal) minimum size; where long edges of SHEETROCK Wallboard are applied across furring, strips should be 2"x2" or 1"x2" (nominal) minimum size. Spacing of furring strips should follow recommendations for maximum spacing of nailing members shown in table on page 60. Fasteners for application of SHEETROCK over wood furring on masonry walls should not penetrate through furring strip into masonry.

Note: Application of SHEETROCK over 1"x1" (nominal) wood furring applied across framing members is not recommended since the relative flexibility of furring during fastening prevents proper fastening and tends to loosen nails or screws already driven.

FLOATING INTERIOR ANGLE APPLICATION



The floating interior angle method of applying gypsum wallboard effectively reduces angle cracking and nail pops resulting from stresses at intersections of walls and ceilings. Certain fasteners are eliminated at all interior angles, both where walls and ceilings meet and where sidewalls intersect.

Ceilings—Apply SHEETROCK Wallboard to ceilings first. Follow standard framing practices for corner fastening. Fit wallboard snugly at all angles.

Horizontal Application—Use conventional single nail or screw application where end of board abuts a wall intersection. Where long edges of board are parallel with the intersection, apply the first nail or screw nominally 7" from wall. Use conventional fastening in remainder of ceiling area.

Vertical Application—Use conventional single nail or screw application where long edges of board abut a wall intersection. Where ends of board are parallel to an intersection, apply the first nail or screw nominally 7" from the wall. Use conventional fastening in the remainder of the ceiling area.

Sidewalls—Apply all wallboard to maintain firm contact at the ceiling line and to provide support to ceiling boards previously installed. Along the horizontal angle, apply the first nail or screw nominally 8" from ceiling intersection. At all vertical angles, omit only the corner fastening of the board that is first applied and overlapped in the angle. Nail or screw the overlapping board in conventional manner. Use conventional fastening in remainder of sidewall area.

Double Nailing—When double nailing is used with a floating interior angle, follow nailing requirements outlined above. Conventional framing and ordinary wood back-up or blocking at vertical internal angles must be provided.

BACK-BLOCKING APPLICATION

Back-Blocking is a system designed to minimize an inherent joint deformation ("ridging") in single layer gypsum wallboard construction, which sometimes occurs under a combination of adverse job and weather conditions. The Back-Blocking System, developed by United States Gypsum Company, has been widely used for years and produces outstanding results. This system is patented (Pat. No. 2,736,929) and may be used under a non-exclusive license agreement, readily available upon request.

Back-Blocking consists of laminating cut-to-size pieces of SHEETROCK Wallboard to the back surface of the wallboard directly behind the joints, providing reinforcement to resist stresses which cause ridging.

Back-Blocking of all joints along tapered edges, and floating and Back-Blocking of all end joints, on both sidewalls and ceilings are recommended. End joints on both sidewalls and ceilings may be tapered by the Back-Blocking method at the discretion of the owner, architect, contractor or applicator.



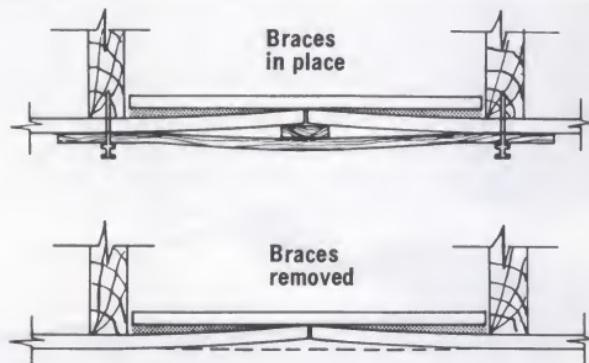
A. Backing blocks, 8" wide and long enough to fit loosely between joists, are spread with PERFA-TAPE Joint Compound (embedding type). Apply adhesive in beads $\frac{1}{2}$ " high, $\frac{3}{8}$ " wide at the base spaced $1\frac{1}{2}$ " o.c.



B. Apply wallboard horizontally with long edges at right angles to joists. Place backing blocks along full length of edge and ends of board. Floating of end joints makes it easier to form a good joint over a twisted stud or joist.



C. Immediately after all blocks are in place, erect the next board which has been previously cut. Butt ends loosely. One man can complete nailing the board while another cements and places the blocks.



D. Cross section shows how floated end joint is tapered and back-blocked. Brace is temporarily nailed over wood strip (top drawing) which depresses ends of boards. When strips are removed, tapered formation remains as shown in bottom drawing.



E. Position sidewall blocks between studs and hold flush with face by wallboard strips which have been recessed against sides of studs. Blocking must be flush or slightly behind nailing face of studs. (Sequence continued on next page.)



F. After wallboard panel is nailed in place, immediately butt adjacent panel over backing block. Stagger end joints between upper and lower courses of panels.



G. To complete back-blocking both sides of a critical wall, follow the same procedure on opposite side of wall. Apply adhesive beads at right angles to horizontal joint to be formed by SHEETROCK soon to be applied.



H. Erect top wallboard panel immediately after spreading adhesive on the blocks. Brace, if desired, and allow 24 to 48 hours drying time. Remove brace and treat joints in normal manner.



DOUBLE LAYER APPLICATION

The following procedure applies to the installation of a double layer of gypsum wallboard to conventional wood framed walls and ceilings in residential construction. SHEETROCK Gypsum Wallboard face layers are job-laminated to a base layer of BAXBORD Gypsum Backing Board that is attached to the framing. Because the construction minimizes the use of mechanical fasteners in the face layer, finer appearance is the result—together with greater strength and higher fire and sound resistance (see Chapter 5 for details). Generally this construction consists of two layers of $\frac{3}{8}$ " gypsum wallboard but other thicknesses may be used to achieve additional values. For thickness of wallboard, applicable spacing of framing and methods of application see Planning the Job, page 59.

MATERIALS

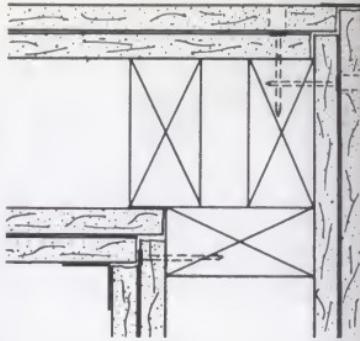
Base Layer— $\frac{3}{8}$ " BAXBORD Gypsum Backing Board in 4'x8' panels is especially designed for double layer system. BAXBORD is economical, easy to handle, and available plain or with aluminum foil on one surface to provide a vapor barrier and reflective insulation on exterior walls and top floor ceilings. (Regular $\frac{3}{8}$ " SHEETROCK Wallboard may be used as an alternate to BAXBORD for base layer.)

Face Layer— $\frac{3}{8}$ " Regular SHEETROCK or predecorated ULTRAWALL Panels in woodgrained or Colorcast finish. **Alternate:** $\frac{1}{2}$ " SHEETROCK Vinyl Panel Wallboard.

Fasteners—For $\frac{3}{8}$ " base layer— $1\frac{1}{4}$ " USG Drywall Screws Type W, $1\frac{1}{4}$ " GWB-54 nails, 4d gypsum wallboard nails, or power driven staples. Staples should be 16 ga. flattened galvanized wire, $\frac{1}{2}$ " wide, 1" long, with divergent points. For temporary support of face layer, use nails of sufficient length to penetrate a minimum of $\frac{3}{4}$ " into nailing member, 6d cooler type nails, double-headed scaffold nails, stucco furring nails, or temporary bracing or shoring. For permanent attachment of predecorated panels, use $1\frac{1}{8}$ " USG Matching Color Nail.

Adhesive—PERF-A-TAPE Joint Compound (embedding type) or USG Laminating Adhesive.

Joint Treatment—PERF-A-TAPE or DURABOND Joint System.



Corner detail

INSTALLATION

Base Layer Ceilings—Apply BAXBORD Backing Board horizontally on ceiling first with long edges perpendicular to framing members. End joints may occur on or between framing members and should be offset from face layer joints by at least 10".
Base Layer Walls—Apply BAXBORD with long edges parallel to and centered on framing members (vertically). **Exception:** for predecorated face layers, apply base layer horizontally; see page 81.

Attachment—Fasten wallboard with power-driven drywall screws, nails or power-driven staples spaced not to exceed the following:

- a. **Drywall screws:** 16" o.c. on framing spaced 16" o.c., 12" o.c. on framing spaced 24" o.c.
- b. **Single nails and staples:** 7" o.c. on ceilings, 8" o.c. on walls. If staples are used, drive staple with crown at right angles to long dimension of framing member except where paper bound edges fall on framing members; then drive staples parallel to edges. Drive staple so crown bears tightly against BAXBORD but does not cut paper.
- c. **Double nails:** 12" o.c. Follow recommendations on page 66.

Face Layer Ceilings and Walls—Apply face layer first either vertically or horizontally depending on whichever results in the least waste and joints; offset joints at least 10". Apply wallboard to walls horizontally except with predecorated ULTRAWALL or SHEETROCK Vinyl Panels.

Attachment—Adhesively apply face panels with PERF-A-TAPE Joint Compound (embedding type) or USG Laminating Adhesive (see Adhesive Application directions page 70).

DOUBLE LAYER CORNER DETAILS

On the inside corner, only the overlapping BAXBORD panel—not the face panel—is nailed to framing. A floating type corner results when joint is reinforced with PERF-A-TAPE Joint System.

On the outside corner, only the SHEETROCK Wallboard—not the BAXBORD—is nailed to the framing. At locations shown, use temporary nails or permanent nails penetrating framing approximately $\frac{3}{4}$ " and countersunk. Finish corner with metal corner bead and joint treatment.



Predecorated Wallboard Application

Predecorated ULTRAWALL or SHEETROCK Vinyl Panels won't warp, shrink or splinter, and provide fire-resistant walls that are easily maintained. Panels are usually applied vertically to the walls so ends occur at floor and ceiling lines, but may be applied horizontally to wainscot height. Not practical as a ceiling finish as end butt joints are difficult to conceal.

Predecorated ULTRAWALL or SHEETROCK Vinyl Panels add glamorous beauty to walls without further decorating. When panels are erected, beveled edges form an attractive "V" joint not requiring joint treatment. Adaptable for use in single or double layer application in new construction or over plaster or wallboard surfaces in remodeling. May also be applied with USG Color Matched Nails to 1"x2" or 1"x3" wood furring strips attached to masonry (see Wood Furring page 74).

INSTALLATION

Apply predecorated panels vertically. Position less than full width panels with the cut edge at the corner. Use USG Color Matched Nails wherever nails are exposed. Drive nails with a plastic-headed hammer, a rawhide mallet, or with a regular hammer having pliable leather placed over head. Space nails at least $\frac{3}{8}$ " from ends or edges.

Single Layer Nail Application—Use USG Color Matched Nails 1 $\frac{1}{8}$ " long for ULTRAWALL and 1 $\frac{3}{8}$ " long for SHEETROCK Vinyl Panels spaced not to exceed 8" o.c.

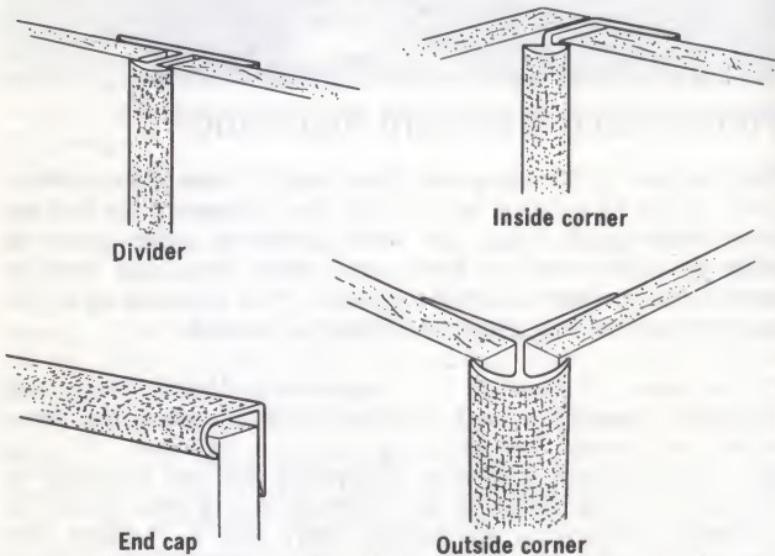
Adhesive Nail-On Application—Recommended where nails at vertical joints are objectionable. Apply SHEETROCK Brand DWA-14 Adhesive in $\frac{3}{8}'' \times \frac{3}{8}''$ bead in the center of all stud faces. Allow adhesive to dry 15 min. before applying panel. Take care to keep adhesive from surface of panels. Impact along studs and drive $1\frac{1}{4}''$ (5d) nails spaced 16" o.c. at floor and ceiling line of panel. Refer to page 67 for detail description of Adhesive Nail-On application method.

DOUBLE LAYER

Nail Application—Use $1\frac{1}{8}''$ USG Color Matched Nails spaced 8" o.c. and driven through the base layer into all studs.

Adhesive Application—When predecorated panels are attached to coreboard or BAXBORD gypsum backing boards, USG Laminating Adhesive or PERFA-TAPE Joint Compound (embedding type) may be used as a laminating adhesive (see page 70).

SHEETROCK Moldings



Aluminum moldings in matching colors and woodgrains are available to provide the finishing touch to ULTRAWALL and SHEETROCK Vinyl Wallboard installations. Refer to Chapter 2 for product description and colors available.

INSTALLATION

1. Start installation from corner or door. Be sure that starting points are plumb or level.
2. Nail moldings with flat head wire nails 8" to 12" o.c.
3. Cut moldings to length with a fine-toothed back saw. For mitering use same procedures as with wood molding.

4. **Divider**—Place divider on panel before putting into position. Nail exposed back flange to stud. Insert butting panel.
5. **Inside Corner**—Place first panel into position. Apply molding over first panel. Insert second panel into place.
6. **End Cap**—Apply panel to wall. Tap end cap molding into position.
7. **Outside Corner**—Place molding over one panel at corner. Nail exposed side to stud. Insert next corner panel.
8. If moldings other than SHEETROCK moldings are used, they should be decorated prior to application over wallboards. Avoid application of masking tapes to moldings or predecorated panels when decorating.

SHEETROCK W/R Application

SHEETROCK W/R Wallboard is a superior water-resistant base for the adhesive application of ceramic, plastic and metal tile. Ideal for use in new construction in high-moisture areas such as bathrooms, powder rooms, kitchens and utility rooms. SHEETROCK W/R is also a cost-saver in modernization. New tile can be installed over existing surfaces without tearing out old walls. Installs quickly and easily by standard attachment methods. Cut edges and nail heads should be coated with SHEETROCK W/R Sealant. Only joints that will *not* be covered with tile need be taped. Once these joints are finished, they are ready for a regular application of paint or wallpaper.



INSTALLATION

Framing—Check alignment of framing. If necessary, fur out studs around tub enclosure and shower stall so that the inside face of the lip of the fixture will be flush with the gypsum wallboard face (see details).

Install appropriate blocking, headers, or supports to support tub and other plumbing fixtures, and to receive soap dishes, grab bars, towel racks or similar items. SHEETROCK W/R is designed for framing 16" o.c. When framing is spaced more than 16" o.c., or when ceramic tile over $\frac{1}{4}$ " thick will be used, install suitable blocking between studs. Place blocking approximately 1" above top of tub or receptor and at mid-point between base and ceiling. Blocking is not required on studs spaced 16" o.c. or less.

Receptors—Install receptors before wallboard is erected. Shower pans, or receptors, should have an upstanding lip or flange at least 1" higher than the water dam or threshold at the entry to the shower.

Gypsum Wallboard—Apply SHEETROCK W/R Wallboard horizontally with the factory (paper bound) edge abutting the top edge of a temporary wood strip (or nail spacer) to allow at least $\frac{1}{4}$ " space between the lip of the receptor, tub or sub-pan and the wallboard.

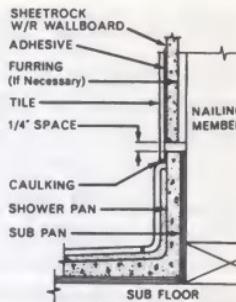
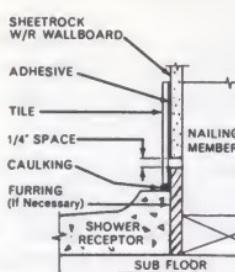
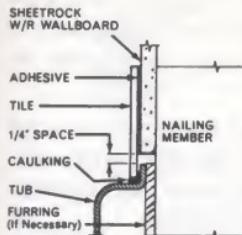
Fasten with nails spaced 8" o.c. max. or drywall screws spaced 12" o.c. max. **Exception:** When ceramic tile over $\frac{1}{4}$ " thick will be used, space nails 4" o.c. max. or drywall screws 8" o.c. max. **Alternate:** When ceramic tiles less than $\frac{1}{4}$ " thick are used, SHEETROCK Brand DWA-14 Adhesive may be used instead of conventional nailing. Use fastener spacing applicable to ceilings.

Treat all cut edges, utility holes and joints, including those at angle intersections with SHEETROCK Brand W/R Sealant prior to wallboard installation. (See photo below.) Treat all fastener heads with sealant after installation.



In areas to be tiled, joints and angles should not be treated with conventional joint systems. Apply regular joint treatment only to joints and fastener heads not to be covered with tile.

In areas where sound transmission control is desired, the wall must be treated the same as for regular wallboard. However, resilient suspension of the board is not recommended where tile is to be applied.

Tub and shower details

Application of Tile—Use an adhesive approved by the manufacturer of the tile or surfacing material for use over gypsum wallboard. For ceramic tile, adhesive should meet CS 181-52. Water-thinned tile mastics and hydraulic cement thinset mortars are not recommended.

Prior to tile erection, caulk flush all openings around pipes, fixtures, etc. with waterproof, non-hardening caulking compound. The tile installation should prevent water passage to backing material. Apply tile down to top edge of shower floor surfacing material, return, or tub lip. Tile should also overlap lip or return of tub or receptor (see details).

Apply tile to completely cover the following areas:

1. **Over tubs without shower heads**—6" above rim of tub.
2. **Over tubs with showers**—minimum of 5' above rim or 6" above height of shower head, whichever is higher.
3. **Shower stalls**—minimum of 6' above shower dam or 6" above shower head, whichever is higher.
4. All jambs in shower stall should be covered to a like height.
5. All areas beyond tub face should be covered a minimum of 4" from required height to finished bathroom floor (below tub rim). Areas beyond an exterior corner are excluded.

For all types of tile, take the following precautions:

1. Completely and continuously grout all tile joints to prevent water penetration.
2. Apply nonsetting caulking compound between wall surfacing materials and shower receptor flange or tub rim.
3. Caulk angle between tub edge and surfacing.

DECORATING RECOMMENDATIONS

Paint—Seal wallboard with solvent-thinned conventional wallboard primer-sealers such as USG Alkyd Enamel Undercoat. If fiber raising occurs, sand smooth and apply second coat. Generally, water-thinned primer-sealers are not recommended.

Use solvent-thinned enamels, semi-gloss or full gloss, such as USG Semi-Gloss Enamel, USG Satin-Lustre or High-Lustre Enamel for finish coats.

Wallpaper—In moist areas where wallpaper is desired, seal wallboard with USG Alkyd Enamel Undercoat or SHEETROCK Sealer. Apply sizing to primed surface for good adhesion of wallpaper.

Metal Trim Application

PERF-A-BEAD, DUR-A-BEAD and ECONO metal corner reinforcement provide strong, durable protection to gypsum wallboard at outside corners. The exposed nose resists impact and forms an exact screed for finishing smooth corners.

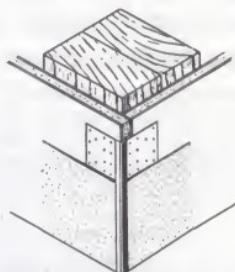
USG Metal Trim serves to protect and finish wallboard around window and door openings and at intersections with other materials. It is recommended for use at the perimeter of partitions acting as sound barriers to form a recess for caulking.

These metal drywall accessories are easily installed by nailing or embedding and concealing flanges with joint compound. For product description, sizes and lengths available, see Chapter 2—Products.

GENERAL APPLICATION INSTRUCTIONS

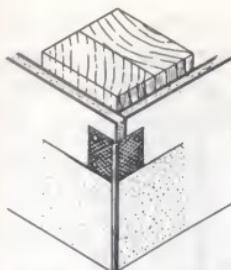
PERF-A-TAPE Joint Compound (embedding type), PERF-A-TAPE All Purpose Ready-Mixed Joint Compound or DURABOND One-Day Joint Compound are recommended for embedding tape and for first coat application over metal flanges.

1. Fasten accessory as outlined below and apply first coat of joint compound. Use nose of bead or trim as a screed for determining proper thickness of coat. Allow PERF-A-TAPE compound to dry 12 to 24 hours. (Under slow drying conditions, allow more time.)
2. Apply second coat of joint compound (and third coat if necessary), feathering edges 2" to 3" beyond preceding coat. Allow each coat to dry thoroughly before applying another coat.
3. Sand lightly as required after each coat to remove jagged particles from metal angle and to smooth previous coat.



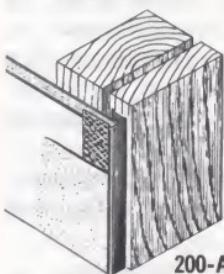
Finishing Outside Corners with PERF-A-BEAD Reinforcement

1. Apply joint compound on both sides of corner over entire area to be covered by PERF-A-BEAD.
2. Place PERF-A-BEAD tightly against corner and completely seat bead by running thumb and forefinger up and down outside nose of corner. Apply pressure with fingers to both paper flanges. Embed flanges by drawing knife down each side and removing excess compound under flanges.
3. Using metal corner angle as a screed, apply second and third coats of joint or topping compound as described above.

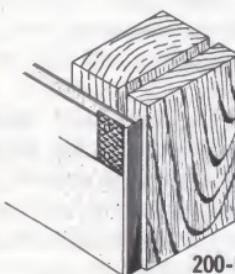


Finishing Outside Corners with DUR-A-BEAD and ECONO

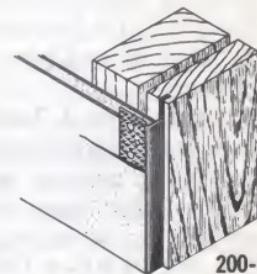
1. Apply with wallboard nails or screws spaced 3" apart on alternate flanges. Nail to framing through gypsum wallboard.
2. Finish with two or three coats of joint compound applied as described above.



200-A



200-B



200-C

APPLYING METAL TRIM

No. 200-A USG Metal Trim—Apply SHEETROCK Wallboard, omitting fasteners at framing member where metal trim is to be installed. Leave a space $\frac{3}{8}$ " x $\frac{1}{2}$ " wide between edge of wallboard and race of jamb. This spacing adds a fluted effect to openings and provides space for hardware or door bucks.

1. Slip metal trim over edge of wallboard, with wide knurled flange on room side of wallboard.
2. Nail through holes provided in knurled flange into wallboard and jamb, using fasteners recommended for thickness of wallboard and spaced not more than 6" o.c.
3. Finish with two or three coats of joint compound.

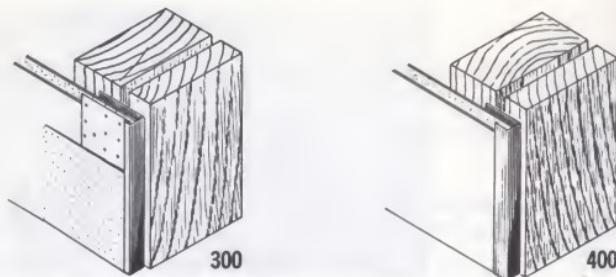
No. 200-B USG Metal Trim—Apply SHEETROCK Wallboard as described for No. 200-A trim, omitting nails and leaving $\frac{3}{8}$ " x $\frac{1}{2}$ " space at edge of jamb.

1. Place trim on edge of wallboard with knurled flange exposed, and nail to wallboard and framing with nails spaced no more than 6" o.c.

2. Finish with two or three coats of joint compound.

No. 200-C USG Metal Trim—This metal trim requires a slotted jamb for installation. Before installation, kerf door and window jambs $\frac{1}{8}$ " wide and $\frac{1}{2}$ " deep, kerf being $\frac{3}{8}$ " back from face of jamb. Apply SHEETROCK Wallboard as described for No. 200-A trim, with edge of wallboard bordering kerf.

1. Insert plain metal flange in kerf, with knurled flange over face of wallboard.
2. Nail knurled flange to wallboard and framing, using recommended nails spaced not more than 6" o.c.
3. Finish with two or three coats of joint compound.



No. 300 PERF-A-TRIM Metal Casing—Erect SHEETROCK in the usual manner, but omit nailing closer than one stud away from area in which PERF-A-TRIM is to be installed. Leave space $\frac{3}{8}$ " to $\frac{1}{2}$ " wide between edges of jamb and gypsum wallboard.

1. Hold PERF-A-TAPE wing open and insert metal flange of PERF-A-TRIM between frame and wallboard. Press into place.
2. Align face of trim parallel to, and $\frac{3}{8}$ " to $\frac{1}{2}$ " away from, face of jamb.
3. With PERF-A-TAPE wing still held open, nail wallboard to framing, penetrating metal flange in the process.
4. Fold wing over wallboard and embed with joint compound. Apply finish coats of compound in regular manner, using edge of trim as a screed to get a smooth, even finish.

No. 301 PERF-A-TRIM—Install in same manner as above.

No. 400 USG Metal Trim—Apply trim to wall before SHEETROCK Wallboard goes up, by nailing into framing through long leg about 8" o.c. Slide SHEETROCK into channel; it is firmly held in place by short leg. No further edge nailing is necessary. Use same method for Nos. 401 and 402 Metal Trim.

Joint System Application

The PERF-A-TAPE Joint System serves to conceal and reinforce joints between SHEETROCK wallboard panels at flat butt joints, internal vertical corners and wall-ceiling intersections. Joint Compound effectively conceals exterior corner reinforcements and exposed fasteners; repairs damaged wallboard to provide smooth continuous interior walls and ceilings ready for decoration. Joint treatment is not required when predecorated ULTRAWALL or SHEETROCK Vinyl panels are used.

These outstanding qualities have been developed in U.S.G. joint compounds: easy mixing, smooth working, ample wet mix life, good bond, minimum shrinkage, tight cohesion, minimum edge cracking, easy sanding, and no alkali burning of paint.

In reinforcing tape, U.S.G. has incorporated superior qualities of strength—as strong as the board itself—plus wafer-thinness for easy embedding, spark perforations to avoid air pockets and photographing, chamfered edges to resist cracking, pre-creasing for easier folding, and a natural bond with the compound.

To better solve the problems of the builder and drywall contractor, U.S.G. offers three systems for joint reinforcement of gypsum wallboards:

1. **PERF-A-TAPE Joint System**—the standard of excellence among products used for embedding tape and finishing.

2. PERF-A-TAPE All Purpose Ready-Mixed Compound—ready for immediate use in taping or topping. Saves time and waste on the job.

3. DURABOND One-Day Joint System—provides fast application, reduced shrinkage, earlier occupancy. Compound hardens chemically and is ideal when drying conditions are slow.

See Chapter 2 for detailed description of products, sizes and types available; Chapter 7 for application tools.

APPLICATION CONDITIONS

In cold weather (outdoor temperatures lower than 55°F.), thermostatically controlled heat must be provided to maintain 55°F. minimum temperature both day and night before, during and after entire joint treatment operation until house is occupied. Ventilation should be provided to eliminate excessive moisture. In glazed buildings, this may be accomplished by keeping windows open approximately two inches top and bottom (or side-pivoted windows approximately four inches) to provide air circulation. In enclosed areas lacking in natural ventilation, temporary circulators should be used. Under slow drying conditions, allow additional drying time between coats of compound.

Applicators will recognize rapid drying conditions when the compound takes on a shorter working life especially on the feather edges and where one joint joins or crosses another. Rapid drying is usually due to low humidity and warm winds. During these periods make every effort to prolong the working and drying time of the compound. Stop drafts by closing doors and windows. Raise the humidity by liberally sprinkling subfloors with water and placing open cans of water about the job. *Do not thin joint compound with additional water!*

CHECK WORKING SURFACES

Gypsum wallboard must be *firmly* fastened to framing members without cutting the surface paper or fracturing the core. Otherwise fastener "pops", ridges and cracking can be expected. Make certain board joints are aligned. When one board is higher than another it becomes difficult to leave sufficient compound under the tape covering the high board. Blisters, bond failure and cracks can easily develop in these areas. Check width and depth of the taper in the board. Too deep a taper often causes trouble. Green or wet framing lumber must be avoided at all costs, for warping and racking is almost sure to result which can cause not only fastener "pops", cracks and ridging but complete failure of the joint. Boards should be allowed to join normally, neither forced together or spaced apart. Open spaces between boards of $\frac{1}{4}$ " or more should be filled with compound at least 24 hours prior to embedding or first coat work. Good planning prior to hanging board will eliminate many unnecessary joints and avoid joints formed by more than two boards.

CARE OF EQUIPMENT

As with other crafts, applicators should keep tools and equipment clean and in good repair to secure maximum benefits. Mechanical taping and finishing equipment must be kept in perfect working order and all parts *must* be replaced as soon as they show the slightest signs of wear.

Mixing PERF-A-TAPE Compound in dirty buckets or failure to wipe down bucket as material is used causes lumps, scratches and usually creates hard working material.

DURABOND Joint Compound is a hardening type material requiring that all tools, mixing containers, bread pans, etc., used for its application be *thoroughly* cleaned before this hardening action occurs. Care of equipment is beyond our control and, therefore, United States Gypsum cannot assume any responsibility for any loss or damage to equipment.

Flush and clean DURABOND Joint Compound from equipment with a conventional garden hose and nozzle before the hardening action takes place. *Immersion of equipment in water will not prevent hardening of the compound.* Ames Tools:

Automatic Taper: (Bazooka) Remove head plate and thoroughly clean upper plunger area. Use narrow stiff bristle brush to clean head mechanism. Flush tube.

Hand Pump: Pump water through pump until clean. Remove bottom screen from pump and flush this area of the pump and the screen.

Finishing Boxes, Corner Roller, Release plunger plate to simplify cleaning box.

Corner Finisher: Flush with water until clean.

PERF-A-TAPE Joint System Application

MIXING

1. Mix PERF-A-TAPE Compound in a clean container. A 1"x2"x4' wood strip makes a convenient mixing paddle; the common commercial potato masher is also effective. Power mixing saves considerable time, particularly where mixing in a central location is convenient. Power may be supplied by a ½" heavy duty electric drill operating on 115 volts AC-DC at not over 400 RPM (200 to 300 RPM even better). Drills operating at high speeds whip air bubbles into compound. Mixing paddles may be of many variations. (See Chapter 7—Tools.)

2. Use clean (drinkable), lukewarm water (not hot) in proportions as given in container directions. Pour the water into pail; then add the compound to the water slowly.

3. Stir vigorously for approximately 1½ minutes—be sure all compound is uniformly damp. At this point, the mass will appear somewhat dry and mealy. (Do not add additional water.) Excess water will not accelerate solution process although compound may appear to be in workable consistency. Over-thinned or "soupy" compound often leads to excessive or delayed shrinkage as well as bond failure.

4. Let mix stand for 30 minutes (longer at lower temperatures) to allow proper solution of the material.

5. Stir vigorously for approximately 1 minute, breaking down any lumps. Compound is now ready.

6. The best consistency is a little thinner than putty, but thick enough to be handled without excessive droppings. Additional water of room temperature may be added, if necessary, to thin. To thicken mixture add small amounts of compound and repeat steps 3, 4 and 5.

Important: Add nothing to PERF-A-TAPE Compound except clean water; otherwise, bonding quality may be seriously affected and a job failure may result.

HAND TOOL APPLICATION



Buttering Joints. Check all nails by drawing finishing knife across fasteners. Drive home protruding fasteners in board, leaving a dimple in surface paper of SHEETROCK Wallboard. Using a broad steel finishing knife, butter PERF-A-TAPE Joint Compound into channel formed by tapered edges of SHEETROCK, filling channel fully and evenly. Avoid heavy fills which increase the possibility of excessive shrinkage and check cracking.

Embedding Tape. Center PERF-A-TAPE reinforcement and press it down into fresh joint compound. Holding knife at an approximately 45° angle to board, draw knife along joint with sufficient pressure to remove excess compound. Leave sufficient compound under tape for proper bond but not over $1/64"$ under feathered edge. Do not use topping or finishing compound for embedding tape.



Covering Tape. When tape is embedded, apply a skim coat of joint compound immediately after embedding. This skim coat reduces the possibility of edge wrinkling or curling which may lead to edge cracking. Allow to dry completely. (See "Drying Time Guide," page 99.)



Spotting Fastener Heads. Apply first coat of compound over all fastener heads immediately prior to or after embedding tape. Use pressure on knife to finish compound level with wall surface. Spot fastener heads in a similar manner during second coat application of compound. During application of third coat over joints, sand fastener heads lightly and apply third finishing coat over fastener heads. DURITE SCREEN-BAK sanding cloth, 320 or 220 grit, is recommended for best results. Allow compound over fastener heads to completely dry. Light sanding may be necessary before decoration.



Second Coat Application. After embedding and covering coat is completely dry (under good drying conditions, 24 hours), apply second coat, feathered approximately two inches beyond edges of first coat. Spot fastener heads with a second coat application of compound. Allow to dry.

Third Coat Application. After second coat is dry, sand lightly. Apply a thin "finishing" coat to joints and fastener heads. Feather joint edges at least two inches beyond second coat. Sand lightly when dry.

End Joints. Butt or end joints are treated the same as tapered joints. When SHEETROCK Wallboard is applied, end joints should be loosely butted together. Fill joint with compound to a point slightly above surface of boards to allow for shrinkage in drying. Apply additional compound along each side of joint and embed tape as described for tapered joints. Apply covering, second, and third coats in same manner as for tapered joints. Finishing coats of PERF-A-TAPE Compound must be feathered wider (approximately 18"), because there is no taper in which to embed tape.



Finishing Inside Corners. Fold tape along center crease. Butter both sides of corner with PERF-A-TAPE Joint Compound and apply tape. Apply second and third coats of compound (one side at a time) in the same manner that you would use to finish flat joints.

The PERF-A-TAPE corner tool with two blades specially angled to work the 90° inside corners of walls and ceilings may be used. Application procedure is the same, but tape and compound can be applied on both sides in one operation. Corner tool is angled slightly so about 1½" of blade tips contact the corner. After embedding tape, remove excess compound with tip of either blade. Final finishing is done with long continuous strokes.



MECHANICAL TOOL APPLICATION

1. Using compound of suitable consistency, mechanically tape all joints. Touch up with **broad knife**. **Allow to dry.**



2. Mechanically tape interior angles. Finish both sides of angles with corner roller and corner finisher. Touch up with broad knife as necessary. Allow to dry.



3. Apply second coat of compound over tape on flat joints using hand finisher tool. Using compound of thicker consistency, spot fastener heads and apply first coat to metal trim. Allow to dry.
4. Apply third coat of compound to flat joints feathering edges about 2" beyond preceding coat. Apply finish coat to metal trim and fastener heads. Allow to dry and sand lightly as required before decoration.

PERF-A-TAPE READY-MIXED COMPOUND APPLICATION

1. **PERF-A-TAPE All Purpose Ready-Mixed Compound**, suitable for embedding tape and fine finishing, is applied in same manner as other **PERF-A-TAPE** joint compounds. Use hand tool consistency for hand application, spotting fasteners and finishing metal trim. Use machine tool consistency for mechanical embedding and finishing.

2. Use the compound at package consistency to minimize shrinkage. If a thinner material is desired, Ready-Mixed can be quickly and easily thinned with water using a potato masher type mixing paddle. A drill type mixer is not recommended as this tends to whip air into the compound. Add the water gradually to speed the thinning process. When possible use cool to lukewarm (not hot) water. If applicator should inadvertently over-thin, simply add additional Ready-Mixed Compound to thicken and

remix. To hold the wet mix in a metal container for prolonged periods, cover with a damp cloth or a thin layer of water. Pour off water, retemper for use.

3. Ready-Mixed Compound is sensitive to cold weather and must be protected from freezing. If material becomes frozen allow it to thaw at room temperature (do not force the thawing process). Retemper and usually it will again be usable, *unless* it has been subjected to several freeze-thaw cycles.

4. Ready-Mixed Compound can be used in tools and containers previously used for powder compound without a thorough "clean out." Ready-Mixed Compound can be used as a topping over powder compound joints which have thoroughly dried, as a taping compound when powdered PER-A-TAPE Compound is to be used as a topping, or as a topping over DURABOND Joint Compound.

DURABOND Joint System Application

MIXING DURABOND JOINT COMPOUND

1. Mix DURABOND Joint Compound in a clean 5-gal. (preferably pliable plastic) container with a power driven mechanical mixer or commercial potato masher (see Chapter 7—Tools). Keep mixing buckets and tools clean at all times. Containers having a residue of other joint compounds in them, or even fragments or suspensions of previously mixed DURABOND compound, may cause erratic hardening of the compound.

2. Always use clean drinkable water for mixing compound. Dirty water (such as that used to clean tools) will contaminate compound and cause erratic hardening. Pour clean lukewarm water (not hot) into the mixing container in the approximate quantities shown below:

	25 lbs.	32 lbs.
a. Hand Tool Application	13½ pts.	17 pts.
b. Mechanical Taping or Finishing Devices	17½ pts.	22½ pts.
c. Mechanical Fill Coat Devices	15½ pts.	19½ pts.

3. Sift the joint compound into the water, allowing no lumps to form that will prevent complete wetting of all the powder.

4. Stir rather vigorously for no more than 3 minutes making sure the compound is uniformly damp. If batch lumps are present, allow the mix to soak for a minute or two. Remix the compound until smooth, and it is ready for use. **Note:** Keep the compound from being contaminated with any other material such as other type joint compounds, dirty water, or previously prepared DURABOND Joint Compound. Contamination will affect the hardening time and properties of the compound.

Mix only as much DURABOND Joint Compound as can be used within the hardening time period shown on the bag (usually 3 hours). The compound will harden chemically after this time period even under water. Do not attempt to hold wet mix or immerse DURABOND Joint Compound coated tools in water to hold back hardening. Retempering the compound is not recommended as this will interfere with the chemical hardening process and cause lumps, soft or powdery joints.

MIXING DURABOND TOPPING COAT

1. Mix DURABOND Topping Coat in a clean 5-gal. container with appropriate mechanical or hand tools (see Chapter 7—Tools).
2. Pour clean drinkable water into the mixing container in the approximate quantities shown below:

	25 lbs.	32 lbs.
a. Hand Tool Application	14½ pts.	18½ pts.
b. Mechanical Finishing Devices	16½ pts.	21 pts.
Never exceed	16½ pts.	21 pts.

3. Sift the joint compound into the water and stir rather vigorously for several minutes making sure all the powder is uniformly damp. If batch lumps are present, allow the mix to soak. Remix until smooth, and compound is ready for use.

Note: Do not add additional water. Over-thinned or "soupy" compound often leads to excessive or delayed shrinkage, softness, and bond failure. Keep the compound from being contaminated with any other material such as other type joint compounds or dirty water.

DURABOND Topping Compound hardens by drying, like PERF-A-TAPE compounds, and can be kept in a wet mix state for about a week by covering with a damp cloth or a thin layer of water. Tools coated with DURABOND topping may be immersed in water for extended periods, without compound hardening.

HAND TOOL APPLICATION

1. Work one room at a time using procedure shown below and techniques for PERF-A-TAPE Joint Compound (see page 91).
2. Spot fastener heads.
3. Embed tape on all joints, angles and PERF-A-BEAD corner reinforcement. First coat DUR-A-BEAD Metal Reinforcement.
4. Immediately apply first fill coat of DURABOND Joint Compound over all flat joints. Use corner tool for interior angles. The second coat application is to be applied over the first coat application even though it is still wet.
5. Apply second coat over fastener heads. For best results use material which has been mixed for some time, but not hardened.
6. Repeat steps 1 through 4 for each additional room.
7. Steps 1 through 5 should be scheduled for completion with DURABOND Joint Compound by the noon-hour break if the house is to be completed the same day. Once the DURABOND Joint Compound has hardened, however, it may be recoated with DURABOND Topping Coat or PERF-A-TAPE Ready-Mixed Compound at any time.
8. Apply finish coat or final topping coat of DURABOND Topping Coat or Ready-Mixed Compound completely covering all joints, fasteners, corner beads and interior angles, using a hand corner finishing tool designed for this purpose. DURABOND Joint Compound applications must be completely hardened before the finish coat of compound is applied.

MECHANICAL TOOL APPLICATION

1. Work entire house at one time. Plan and schedule job in accordance with the hardening time of the compound.

2. Spot fastener heads throughout entire house. Compound mixture is to be heavy for this application and is to be saved for use on metal bead and second coat on fasteners.
3. Mechanically tape joints and angles in entire house. Both sides of angles are treated with corner finishing tools at this time.
4. Apply DURABOND Joint Compound to all DUR-A-BEAD and ECONO corner reinforcement and use for applying PERF-A-BEAD reinforcement.
5. Immediately apply first fill coat of DURABOND Joint Compound with mechanical tools over all flat joints. This coat is applied even though the first coat is still wet.
6. Apply second coat to all fasteners. For best results use material which has been mixed $2\frac{1}{2}$ hours before application.
7. After all the DURABOND Joint Compound has hardened, apply the finish coat or final topping coat of DURABOND Topping Coat or PERF-A-TAPE Ready-Mixed Compound completely covering all joints, angles, corner bead and fasteners.



COLD WEATHER TIPS ON TAPING AND FINISHING

All drywall joint compounds react to cold weather. Low temperatures slow the solution rate of the binder, and the mixing operation takes longer than on warmer days. After the initial mix, the compound should stand until a complete breakdown of the binder has taken place. This will require *at least 30 minutes and often much longer*, particularly if very cold mixing water has been used. If the temperature of the wet mix is estimated to be below 60°F., it should stand a minimum of one hour and up to two hours if the temperature is below 55°F.

Failure to recognize and adhere to proper cold weather practices can lead to a number of serious and costly problems; bond failure, delayed shrinkage and paint discoloration, just to name a few of the more common types. In addition, any attempt to use material not completely in solution can increase application costs considerably. A heavy, dry working compound with a tendency to curl up behind the tools, especially on feathered edges during periods of low temperature, indicates that the binder is not yet properly dissolved. Further evidence of compound not in solution is indicated by a "salt and pepper" appearance in the compound after being applied to the joint.

Good work can be secured during winter with very little extra

effort or expense. Here are a few *tips* which will produce the desired results:

DON'T—add extra water just to speed up or ease the mixing operation. If the water temperature is very low, a small additional amount of water may be added (never more than an extra pint per a 5-gal. mix) to give more suitable working properties. Excessive water will cause excessive "sloughing off" or "watering down" as the mix stands in the pail. If applied to the surface, drying time is significantly slowed down, resulting in delayed shrinkage.

DON'T—use excessively cold or dirty mixing water, for it will make mixing difficult and delay the solution rate considerably. Here again bond failure and delayed shrinkage can easily occur. Many applicators bring warm (not hot) water from home. Others employ a blow torch to the side of the bucket for just the few minutes required to take the chill off the water prior to adding the compound. Still others mix the compound at home and bring to the job the following day. This practice insures peak performance from the compound during cold weather.

DON'T—allow compound to freeze in the bucket or on the wall. Once frozen, the material loses almost all its bond strength and must be replaced. If Ready-Mixed Compound freezes, move to room temperature to thaw. (*Do not* force thawing.) Re-mix and generally it will be usable.

DON'T—store tape and compound in areas subject to dampness. Tape is particularly sensitive to poor storage conditions, picking up moisture rapidly—one of the causes of center humping. Dampness seriously affects the working qualities of both tape and compound.

DO—provide proper heat and adequate air circulation. A minimum temperature of 55°F. should be maintained day and night all through the erection of the gypsum wallboard, taping, finishing, and until final decoration is thoroughly dry. The best practice by far is to use central heat. Temporary heat provided by salamanders, space heaters or unvented gas burners is usually unsatisfactory. Insufficient venting to carry off fumes from this type heating can cause staining of joint compound. Improper heat or inadequate air circulation causes uneven drying, leading to bond failure, delayed shrinkage and paint discoloration.

DO—provide proper ventilation to allow moisture to escape. Open windows slightly in various locations.

DO—allow sufficient drying time between coats and especially before any decorating is started. Cold, damp weather will cause slow drying of all types of joint and finishing compounds. Under adverse job conditions 48 hours drying time between coats is often insufficient. (See Drying Time Guide shown below.) Finishing over seemingly dry base coats, which are actually wet underneath, is the principal cause of job failures and especially delayed shrinkage and joint discoloration. Joint compound which remains wet for a prolonged period tends to shrink excessively. Compounds requiring 48 to 72 hours to dry will always shrink more than if they had dried in 24 hours (except DURABOND Joint Compound).

DO—plan work well ahead to operate under the most favorable circumstances. Mix compound well in advance—one of the major cold weather advantages of **PERF-A-TAPE** Compound and Topping is that both can be held in a wet mix for 7 to 10 days without losing strength or fine application qualities. Insist on proper working conditions and resist all pressures to speed up applications until the preceding coat is thoroughly dry on every surface and angle.

DRYING TIME GUIDE

This guide provides a means for estimating drying requirements for drywall joint compound under various temperatures and humidity conditions. To figure drying time, determining the temperature and humidity with a sling psychrometer (see photo), then apply these figures to the chart on next page.

The drying times shown are for joint compound under tape, for evaporation of 10 lbs. water per 250' tape, corresponding to 1/16" to 5/64" wet compound thickness under the tape. The drying times for thicker (or thinner) coats of wet compound between the tape and board will be increased (or decreased) approximately in proportion to the wet compound thickness.

These drying times apply when the exposed surface of the tape is bare or nearly bare. A heavy compound coat over tape lengthens drying time.



Guide to Drying Time—Joint Treatment

Relative Humidity	Temperature					
	50°	60°	70°	80°	90°	100°
10%	21H	14H	10H	7H	5H	3½H
20%	23H	16H	11H	8H	5½H	4H
30%	26H	18H	12H	9H	6H	4½H
40%	29H	20H	14H	10H	7H	5H
50%	36H	24H	17H	12H	9H	6H
60%	42H	29H	20H	14H	10H	8H
70%	2½D	38H	26H	19H	14H	10H
80%	3¼D	2¼D	38H	27H	19H	14H
85%	4D	3D	48H	34H	25H	18H
90%	6D	4¼D	3D	49H	36H	26H
91%	7D	4¾D	3¼D	2¼D	40H	29H
92%	8D	5D	3½D	2½D	44H	32H
93%	9D	6D	4D	2¾D	48H	36H
94%	10D	7D	5D	3¼D	2¼D	41H
95%	12D	8D	6D	4D	2½D	48H
96%	14D	10D	7D	5D	3½D	2½D
97%	18D	12D	9D	6D	4½D	3¼D
98%	26D	18D	12D	9D	6D	4½D

D=Days (24 hrs.)

H=Hours

USG Cover Coat Application

With ready-mixed USG Cover Coat, drywall contractors are able to offer smooth or textured, white, ready-to-decorate surfaces on concrete ceilings and columns located above grade. Smooth application and excellent bonding strength make USG Cover Coat ideal for filling small holes and crevices and for second and following covering applications with drywall methods and tools. USG Cover Coat should not be applied over moist surfaces or surfaces likely to become moist (by condensation or otherwise), on ceiling areas below grade, on surfaces which project outside the building, or on other areas which might be subject to moisture, freezing, efflorescence, pitting or popping, movement, or other abnormal condition.

APPLICATION

1. For best results apply USG Cover Coat before interior partitions are erected. Use the compound at package consistency to minimize shrinkage. If a thinner material is desired, the compound may be thinned by adding clean water (up to one pint per 5 gals. Cover Coat) and mixing to desired consistency using a potato masher or low-speed drill type mixer. If applicator should inadvertently overthin, simply add additional Cover Coat to thicken and remix.
2. Protect USG Cover Coat from freezing. During entire application, temperature must be maintained at or above 55° F., and heat and ventilation must be provided when necessary.
3. All areas to be treated must be clean, dry and free from contaminants and all exposed metal protected with a rust preventative paint. Large projections should be chiseled off and brought flush with the concrete surface.
4. Apply USG Cover Coat over the joints and ridges left by

the concrete forms with a "flat box" or knife. Fill in and/or level out small holes and lumps, ridges, lips, etc. with compound. Allow to dry.

5. Using two men, apply first coat of Cover Coat to entire surface area of ceiling, beam, or column with "flat box" or regular knife. Keep moving in one direction, making sure that each application overlaps the previous one. Follow "box" application with a pole drywall blade, 24" or wider, to smooth out "box" application, leaving a minimum of ridges and imperfections. Coordinate application of **PERF-A-BEAD** reinforcement on angles and corners as required, embedding tape and covering both flanges with a smooth fill of Cover Coat. Allow to dry (under good drying conditions, 24 hrs.)

6. **Second coat application**—sand and dust first coat. Apply second coat with "box" and pole drywall blade application described above or texture at this point if desired. Allow to dry. Sand to ultimate smoothness with fine sand paper, if necessary.

7. A very rough or uneven concrete surface may require three or more coats applied in the same manner.

8. USG Cover Coat should be dry and dust-free if further decorating is desired. Seal with a good quality sealer (**SHEETROCK** Sealer or **TEXOLITE** Primer-Sealer is recommended) before finish decoration is applied.

9. More detailed written directions and special uses are available on request. Ask for Bulletin J-28.

Special Applications

ARCHES



Arches of any radii are easily faced with **SHEETROCK** Wallboard and finished with **PERF-A-TAPE** Joint System. Score or cut through back paper of wallboard at 1" intervals to make board flexible. The board should previously have been cut to desired width and length of arch.

After board has been applied to arch with nails or screws, butter horizontal and vertical corner surfaces with compound. Crease PERF-A-TAPE in center. Make scissor cuts half-way through tape every $\frac{3}{4}$ " to make tape flexible. Apply tape half with cuts to wall surface, and fold over uncut half of tape onto underside of arch, as shown. Embed and apply second and third finishing coats of joint compound.

CURVED SURFACES



SHEETROCK Wallboard can be formed to almost any cylindrically curved surface. To apply board, place a stop at one end of the curve and gently and gradually push on other end of board, forcing center against framing until curve is complete.

By moistening the face and back paper thoroughly prior to application, and replacing in the stack for at least one hour the board may be bent to still shorter radii. When the board dries thoroughly, it will regain its original hardness.

Minimum Bending Radii of Dry SHEETROCK Wallboard

Thickness	Length	Width
$\frac{1}{2}"$	20'**	
$\frac{3}{8}"$	7½'	
$\frac{1}{4}"$	5'	25' 15'

**Bending two $\frac{1}{4}"$ pieces successively permits radii shown for $\frac{1}{4}"$ SHEETROCK.

SLIDING DOOR LAMINATION



Sliding Door Frame—**SHEETROCK** is laminated to framing members with **PERF-A-TAPE** Joint Compound (embedding type). This virtually prevents both fastener pops and the possibility of fasteners protruding through the usual $\frac{3}{4}$ " backing of frame. After installing sliding door frame, check to make sure there is sufficient backing where **SHEETROCK** panels join. Normally, this is about 4' up from subfloor.



Adhesive Application—Properly measure and cut **SHEETROCK** to fit over frame. Using a spreader blade, spread regular **PERF-A-TAPE** Joint Compound on section of sliding door frame to be covered first (normally the top section). This prevents pre-drying of adhesive. **PERF-A-TAPE** Joint Compound should be mixed to adhesive consistency and applied in beads $\frac{1}{2}$ " high, $\frac{3}{8}$ " wide at the base and spaced $1\frac{1}{2}$ " o.c.



Application of SHEETROCK—Immediately following application of compound, apply prefitted **SHEETROCK** Wallboard to upper section of frame. Spread lower section of frame with compound and apply prefitted **SHEETROCK** Wallboard.



Shoring—Once wallboard is in place, pieces of wood or strips of SHEETROCK are temporarily nailed to frame with 6d double headed nails to hold SHEETROCK firmly while compound dries.

Finish—When PER-A-TAPE Joint Compound has dried (usually overnight), remove temporary shoring, dimple remaining nail holes in the wallboard, and finish wallboard in normal manner.

RESURFACING OLD WALL & CEILING SURFACES



Where ceilings or sidewalls are so badly disfigured that an entirely fresh surface is desirable, they may be resurfaced using a layer of $\frac{1}{4}$ " or $\frac{3}{8}$ " SHEETROCK Wallboard. Bright, new surfaces may also be obtained using predecorated ULTRAWALL or SHEETROCK Vinyl Panels. For resurfacing masonry walls, see application of SHEETROCK to Wood Furring, page 74.

Preparation—Remove all trim (this is not always necessary when using $\frac{1}{4}$ " SHEETROCK). Remove all loose or poorly bonded material. Fill small holes with joint compound or patching plaster. Patch large holes to the surrounding level with single or multiple layers of SHEETROCK nailed to framing and shimmed out as required.

Electrical outlet boxes for switches, wall receptacles and fixtures should be extended outward to compensate for the added wallboard thickness.

Locate joists and studs by probing, and draw a chalk line to mark their full run. Where great irregularities of surface exist, apply furring strips not over 16" o.c., using wood shingles to shim out to a true, even plane.

Installation—Apply SHEETROCK horizontally or vertically, whichever method is most practical. Fasten with gypsum wallboard nails, cement coated, spaced 7" on ceilings, 8" on sidewalls. Nails must be long enough to penetrate into framing members at least $\frac{5}{8}$ ". Nail ULTRAWALL or SHEETROCK Vinyl Panels over existing walls with $1\frac{1}{8}$ " matching color nails using a plastic headed hammer.

Wallboard may be adhesively applied over existing walls with PERF-A-TAPE Joint Compound or USG Laminating Adhesive (see Adhesive Application, page 70, for directions).

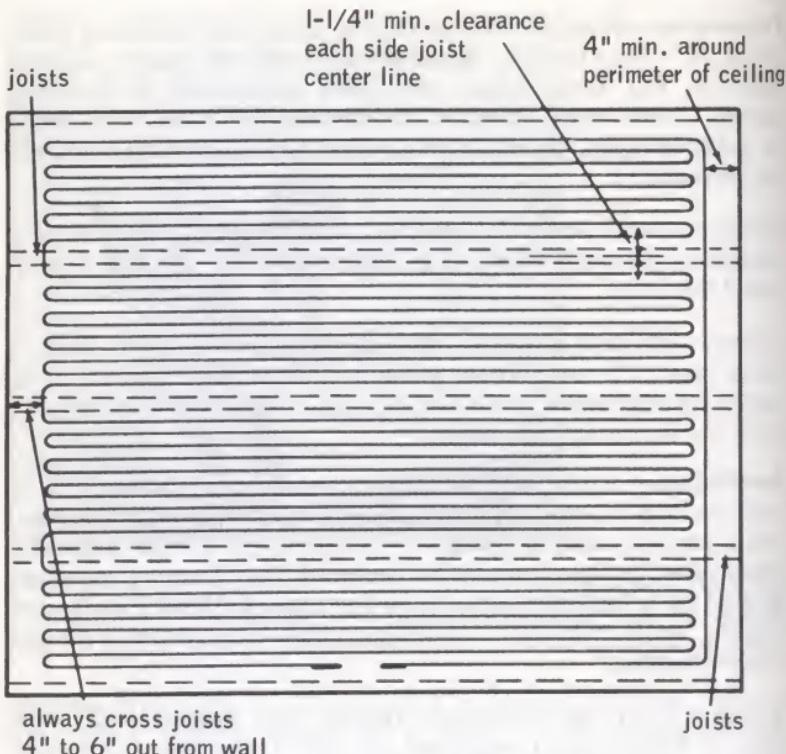
Finish SHEETROCK wallboard with metal corner reinforcement and joint treatment as necessary and replace all trim.

RADIANT HEAT APPLICATION

During recent years electric heat has shown continued growth in residential and high-rise construction. Extensive research to produce improved insulation and electric heating systems, together with reduced electrical rates and savings in original equipment, have contributed to this growth. The convenience of individual room comfort control, cleanliness, low cost and space-saving features of electric cable radiant ceilings have made this construction one of the most popular systems.

Double-layer gypsum wallboard has been used extensively in electric cable radiant heated ceilings. Regular SHEETROCK or BAXBORD backing board is the base layer, heating cables are embedded in a filler, and a face layer of SHEETROCK is attached directly to the adhesive filler.

The fire resistance, economy of installation, reinforced joints and ease of decoration make SHEETROCK ideally suited for this application. However, certain precautions must be taken as outlined below to minimize the possibility of cracking due to thermal shock, shadowing under heating elements caused by unequal initial drying rates and calcination of gypsum wallboard resulting from overheating.



Typical layout—electrical radiant heated ceiling

Design and Installation Recommendations

1. In radiant electric cable heating systems where gypsum wallboards or backing boards are used, the maximum electrical cable temperature should not exceed 125° F. Temperatures exceeding these will produce slow calcination and eventual deterioration of the wallboard.
2. All inspections and testing of the electrical heating system should be completed before the application of face layer of gypsum wallboard.
3. The filler and adhesive must be thoroughly dry before taping and finishing. Good air circulation at the ceiling level is essential to assist drying.
4. The heating system should not be placed into operation until the filler is dry. Allow a minimum of one week with good drying conditions and two weeks in the cold season before turning on heating system. Provide temporary heating on the job when the temperature falls below 55° F.
5. When the heating system is initially operated after decorating, the thermostat should be set at room temperature and raised in 5° increments until the desired operating temperature is reached.

MATERIALS

1. **Base Layer**— $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ " BAXBORD Gypsum Backing Board.
2. **Face Layer**— $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ " Regular SHEETROCK Gypsum Wallboard.
3. **Fasteners**—
 - a. **Base Layer**
Screws— $1\frac{1}{4}$ " USG Drywall Screw Type W.
Nails— $1\frac{1}{4}$ " GWB-54 for $\frac{3}{8}$ " and $\frac{1}{2}$ " thick board.
 $1\frac{3}{8}$ " GWB-54 for $\frac{5}{8}$ " thick board.
 - b. **Face Layer**—GWB-54 type nails providing $\frac{3}{4}$ " penetration, or coated gypsum wallboard nails providing 1" penetration into wood framing.
4. **Filler**—DURABOND Joint Compound with ASTM C-35 sand added in the proportion of 1:1 by weight (approximately 1 part DURABOND to $\frac{1}{2}$ part sand by volume).
5. **Furring Strips**, if used, must be a type which will be stable under high moisture conditions. Quality kiln dried lumber and resin-bound wood chip boards are best. Most soft lumber and fiber type hardboards are unsuitable. If in doubt, check the dealer or manufacturer.
6. **Adhesive**—DURABOND Joint Compound.
7. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.

INSTALLATION

Base Layer—Apply horizontally. Fasten with power-driven drywall screws, nails or power-driven staples spaced not to exceed the following:

1. **Drywall screws**: 24" o.c.
2. **Nails**: 7" o.c. Alternate: Where filler is not used as adhesive, space nails 14" o.c.
3. **Staples**: 7" o.c. driven with crown at right angle to long dimension of framing member, except where paper bound edges fall on framing members, then drive staples parallel to edges. Drive staple so crown bears tightly against BAXBORD backing board but does not cut paper. Legs of staples should be at least $\frac{3}{8}$ " from ends and edges of wallboard.

Electric Heating Cables—Securely attach cables to base layer and space cables between joists in accordance with cable manufacturer's recommendations. Position cables parallel to and between nailing members and at least $1\frac{1}{4}$ " from center of nailing member on each side so that at least a $2\frac{1}{2}$ " unobstructed channel is provided under each nailing member. Cables should cross nailing members only near edges of ceiling, within 4" to 6" from wall. Leave a clear space of at least 4" around the perimeter of each ceiling, and at least 8" around all openings (see typical ceiling layout pattern). Inspect and test heating system before applying face layer.

Filler and Face Layer—Mix filler of DURABOND Joint Com-

pound and sand (see proportions above). Completely embed heating elements in filler, and level to provide complete contact between face layer and base layer of wallboard. When required to produce a uniform thickness of filler and a firm base for nailing, furring strips as thick as the layer of filler may be attached over the base layer parallel to joists.

Immediately apply face layer after filler has been spread and fasten to wood framing with nails spaced 16" o.c. Space face layer nails 8" to 10" away from walls at ceiling perimeters.

When base layer is supported by furring strips attached to wood beams, trusses or joists spaced over 24" o.c. the DURABOND filler, or fill coat, should be applied and allowed to dry completely. Apply a following thin adhesive coat of DURABOND Joint Compound, erect SHEETROCK face layer and fasten with nails 7" o.c.

Finishing—Allow filler and adhesive to dry thoroughly before finishing. Treat all joints and nail heads with DURABOND or PER-A-TAPE Joint system and allow to dry.

Operate heating system only after filler, adhesive and joint treatment are completely dry. Allow a minimum of one week with good drying conditions and two weeks in cold seasons before turning on heating system.

EXTERIOR CEILINGS AND SOFFITS



SHEETROCK Wallboard in $\frac{1}{2}$ " and $\frac{5}{8}$ " thickness is suitable for open porch and carport ceilings and soffits of eaves and rakes when the construction protects the SHEETROCK from direct contact with water.

SPACING OF SUPPORTS

Porch and Carport Ceilings—Space framing not more than 16" o.c. for $\frac{1}{2}$ " SHEETROCK Wallboard and 24" o.c. for $\frac{5}{8}$ " SHEETROCK.

Soffits—For eave or rake projections of 26" or more, space framing not more than 16" o.c. for $\frac{1}{2}$ " SHEETROCK and 24" o.c. for $\frac{5}{8}$ " SHEETROCK. For projections of 26" or less, space framing not more than 24" o.c. provided both edges of the SHEETROCK Wallboard parallel to the building wall are supported by moldings or other suitable means.

Trim Moldings—all edges and ends around perimeter of SHEETROCK exterior ceilings and soffits must be supported by moldings of sufficient size and fastened securely to prevent sagging of the wallboard. Wood facings must be provided between SHEETROCK Wallboard ceilings or soffits of eaves and rakes and brick or masonry work of any kind.

WEATHER PROTECTION

Underlayment—In areas subject to freezing temperatures, shingled roofs should be provided with eave flashing strips of not less than 55 lb. smooth rolled roofing or two layers of 15 lb. felt cemented together, extending inside face of exterior walls not less than: (a) 24" for pitches under 5 in 12; (b) 12" for pitches of 5 in 12 or over. If the pitch or overhang requires strip to be wider than can be covered by a single strip, all laps are to be cemented.

Metal Drip Edge extending a minimum of 3" under shingles must be provided at all roof edges.

Fascia Boards of sufficient width to provide a minimum of $\frac{1}{4}$ " drip below adjacent trim on underside of eave, rake or ceiling must be provided.

Paint—All exposed surfaces should be painted with two coats of USG exterior paint (see Selector Guide, page 54).

VENTILATION

Attic spaces above open porches and carport ceilings should be provided with ventilation in compliance with FHA requirements for attic spaces over living quarters. When SHEETROCK Wallboard is applied direct to rafters, vents should be provided at each end of each span.

Rafters or joist spaces should have minimum of 2" x full width between framing, screened vent at each end of each space.

Vent openings should be framed with wood and located within 6" of outer edge of eave.

FASTENERS

1 $\frac{1}{4}$ " USG Drywall Screws Type W

1 $\frac{1}{4}$ " GWB-54 nails for $\frac{1}{2}$ " board, 1 $\frac{3}{8}$ " length for $\frac{5}{8}$ " board

APPLICATION

Apply SHEETROCK Wallboard with long edges of right angles to framing members. For best results, back-blocking of all joints, and floating of end joints, are recommended (see page 76 for back-blocking procedure). Fasten wallboard with drywall screws spaced 12" o.c. or nails spaced 7" o.c.

Treat exposed joints and fastener heads with PERF-A-TAPE or DURABOND Joint System.

Wood and Metal Runner Attachment



USG Drywall Partitions are secured to floors, ceilings and abutting walls with runners fastened to the supporting structure. The DWR Runner, a metal channel, is most commonly used, particularly with various systems employing a metal stud. The USG Double and Triple Solid Gypsum Partitions are attached with a metal angle runner. A wood runner may be used when a nailing for wood base trim is needed but generally is not acceptable when a fire rating is required.

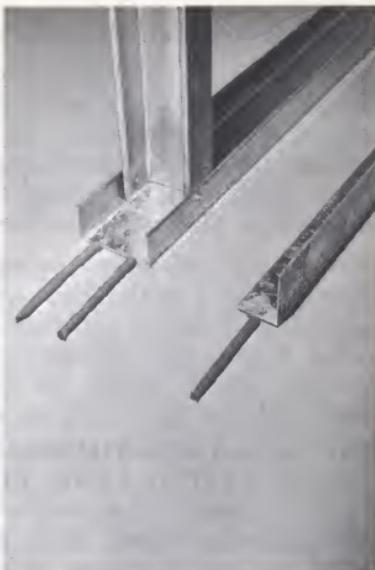
To improve the sound control characteristics of a partition, a non-hardening caulking material should be used under all wood and metal runners to seal the runner to the structure. Caulking under metal runners is required to obtain the sound ratings shown in Chapter 5.

INSTALLATION

Layout Partition—Properly position partition location according to the partition layout. Snap chalk lines at ceiling and floor. Be certain partition will be plumb.

Caulking—

Material—Plastic Sealer No. 579.64 as manufactured by Press-tite Division, Interchemical Co. or equal.



The surfaces to be caulked should be clean, dry and free of all foreign matter. Using an air pressure-activated or hand caulking gun, apply non-hardening caulking compound in beads about $\frac{3}{8}$ " round to the floor and walls and to the back of the ceiling runner. Apply caulking in double beads under wood plates, DWR Runners and wood top and bottom runners and in single beads under angle runners.

Caulking material will keep its proper tacky consistency if stored on the job in an insulated box heated with a 100-watt light bulb.

Runner Installation—After caulking, securely attach runners:

1. **To concrete slabs**—using concrete stub nails, shielded screws, or power-driven fasteners.
2. **To gypsum or concrete block walls**—using square cut nails or power-driven fasteners.
3. **To suspended ceilings**—using expandable molly type fastener or toggle bolts.
4. **To wood framing**—using 12d nails or suitable screws.

Secure runners with fasteners placed at corners, at runner ends and spaced not to exceed 24" o.c. **Exception:** Fasteners securing floor runners in USG Studwall and USG Ribwall drywall partitions and all floor runners attached to wood framing should be spaced not to exceed 16" o.c.

At partition corners extend one runner to the end of the corner and butt the other runner to it allowing clearance for wallboard thickness as necessary. Runners should not be mitered.

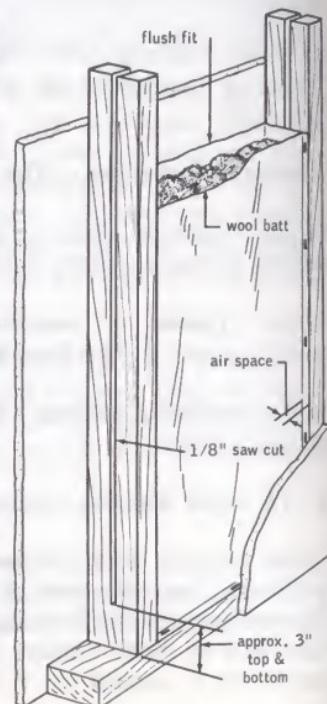
Sound Control Products Application

Many USG Drywall Partitions have been developed to meet the demand for increased privacy between units in residential and commercial construction. Designed for wood stud, metal stud or laminated gypsum board construction, these assemblies offer highly efficient sound control properties, yet are more economical than other partitions offering equal sound isolation.

These improved sound isolation properties and STC (Sound Transmission Class) ratings are obtained by using THERMAFIBER Insulating or Sound Attenuation Blankets or USG Sound Deadening Board. General application procedures for these products are shown below. See Chapter 4 for the specific components and construction details and Chapter 5 for sound ratings.

INSTALLATION—THERMAFIBER INSULATING AND SOUND ATTENUATION BLANKETS

Install blankets to completely fill the height of the stud cavity. If necessary to tightly fill height, cut stock length blankets with a straight edge and knife or with a large pair of scissors for insertion in the void space. Tightly butt ends and sides of blankets within a cavity. Use 12" wide pieces of THERMAFIBER Sound Attenuation Blankets in narrow stud spaces next to door openings or at partition intersections, or install two 12" pieces with tightly butted sides in 24" wide cavities. Fit blankets carefully behind electrical outlets, bracing, fixture attachments, medicine cabinets, etc.



ATTACHMENT—INSULATING BLANKETS

To Wood Studs—Using a power-driven or hand stapling gun, attach paper flanges to sides of studs and at top and bottom

plate with staples having a 9/16" leg and spaced 6" to 8" o.c.

To Gypsum Board—In metal stud and laminated gypsum board partitions, attach blanket to back side of gypsum board using staples applied with pistol type hand stapler. For 1½" and 2" thick blankets use staples with a 9/16" leg, for 3" thick blankets use staples with a 7/8" leg. Place staples at least 2" in from the edges, at each corner and along the vertical edges spaced not to exceed 24" o.c.

ATTACHMENT—SOUND ATTENUATION BLANKETS

To Gypsum Board—Using a pistol type hand stapler, attach blanket at each corner at least 2" in from edges and in center of blanket. Use staples with a 9/16" leg applied through a minimum 2" square heavy paper washer or staple over a 6d nail laid flat on the blanket. Either method prevents staple from pulling through the blanket.

INSTALLATION—USG SOUND DEADENING BOARD

Wood Fiber—Apply base layer of wood fiber sound deadening board vertically with joints staggered on opposite sides of the partition. Attach to each side of wood studs with 6d cement coated gypsum wallboard nails. Space nails 12" o.c. along the vertical edges and 30" o.c. along the intermediate framing.

Apply the 5/8" SHEETROCK FIRECODE Gypsum Wallboard face layer horizontally. Fasten face layer with 7d cement coated nails spaced 7" o.c. and staggered from wood fiber sound deadening board nails. Finish joints with PERF-A-TAPE or DURABOND Joint System.

The above describes fastener spacing and application of wood fiber sound deadening board in 1-hr. fire-rated partition construction (UL Des 17-1 hr) having a 53 STC. Other drywall partition assemblies using wood fiber board are possible.

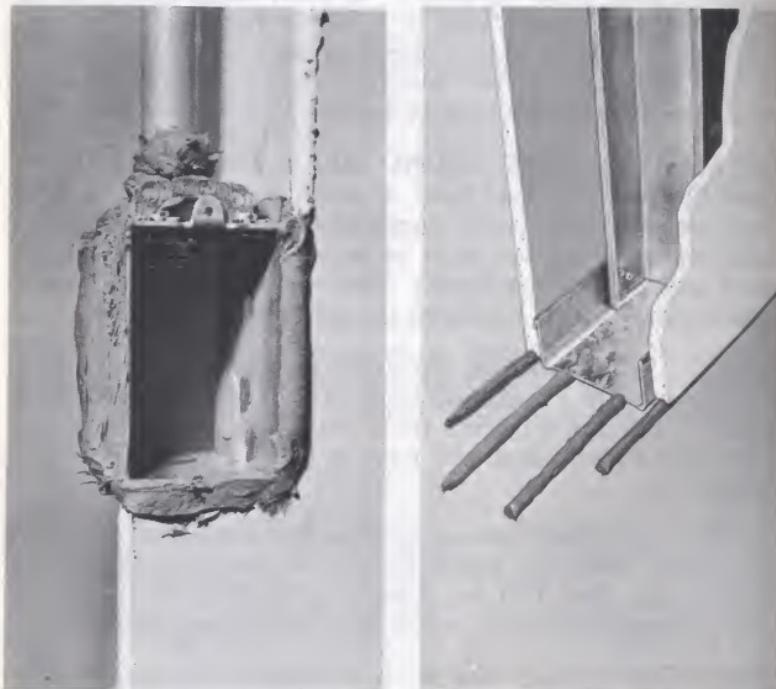
Mineral Fiber—Apply base layer of mineral fiber sound deadening board vertically with joints staggered on opposite sides of the partition. Attach board to each side of metal studs with 1" USG Drywall Screws Type S spaced not to exceed 27" o.c. along vertical joints and at quarter and mid-points of panel height along intermediate stud. Place two screws at each end of board through runner 1" from each vertical edge.

Apply 1/2" SHEETROCK FIRECODE Wallboard face layer vertically with joints staggered from base layer joints. Apply face layer adhesively using PERF-A-TAPE Joint Compound (embedding type) and Sheet Lamination method (see page 71). Fasten board around the perimeter with 1½" USG Drywall Screws Type S spaced 12" o.c. Finish joints.

The above described fastener spacing and application of mineral fiber sound deadening board in 1-hr. fire-rated partition construction (UL Des 23-1hr) having a 48 STC. A similar construction with 5/8" SHEETROCK FIRECODE face layers, screw spacing 16" o.c., and 3½" DWS Metal Studs has a 52 STC and an estimated 2-hr. fire rating.

Caulking Application

Where a drywall partition is used as a sound barrier, a non-hardening caulking material should be used to seal all cut-outs and all intersections with the adjoining structure. The sound that will leak through a one-inch opening will offset the entire sound transmission loss value of a partition. Caulking under runners and around the perimeter of the face layer wallboard is required to achieve sound transmission loss values on the job that approximate those determined by test. Caulking has proven to be the least expensive way to get better sound control.



INSTALLATION

Caulking Material—Plastic Sealer No. 579.64 as manufactured by Presstite Division, Interchemical Co. or equal.

Runners—Apply caulking underneath all runners at the floor and ceiling and runners used at partition intersections with dissimilar wall construction. See Wood and Metal Runner Attachment, page 110 for details.

Partition Perimeter—Apply appropriate metal edge trim to the wallboard face layer around the entire partition perimeter. Leave a groove of approximately $\frac{1}{4}$ " wide at the floor, ceiling and intersections with dissimilar walls. Fill groove with caulking. Finish over groove with base or trim as desired.

Openings—Apply a $\frac{1}{4}$ " minimum round bead of caulking around all cut-outs such as at electrical boxes, medicine cabinets, heating ducts and cold air returns to seal the opening.

Metal Door and Borrowed Light Frames

Metal door and borrowed light frames used with SHEETROCK Wallboard partitions must be rigidly secured to prevent twisting or movement. If door frames are free to twist upon impact, or trim returns are free to vibrate, movement of the frame will tend to pinch the wallboard face paper and crush the core, resulting in unsightly cracks in the finish and loose frames.

Basic considerations for insuring secure metal door and borrowed light frames with wallboard partitions are:

1. Frames must be securely anchored in place.
2. Partition must sit securely in frame so that wall and frame work as a unit. Impact stresses on frame will then be dissipated over entire partition surface and local damage minimized.
3. The frame opening between trim *returns* must be sufficiently wide to allow full insertion of gypsum wallboard.

U.S.G. recommends that metal door and borrowed light frames be formed from 18-ga. steel minimum, shop primed. The opening between trim returns should be accurately formed to the overall thickness of the partition.

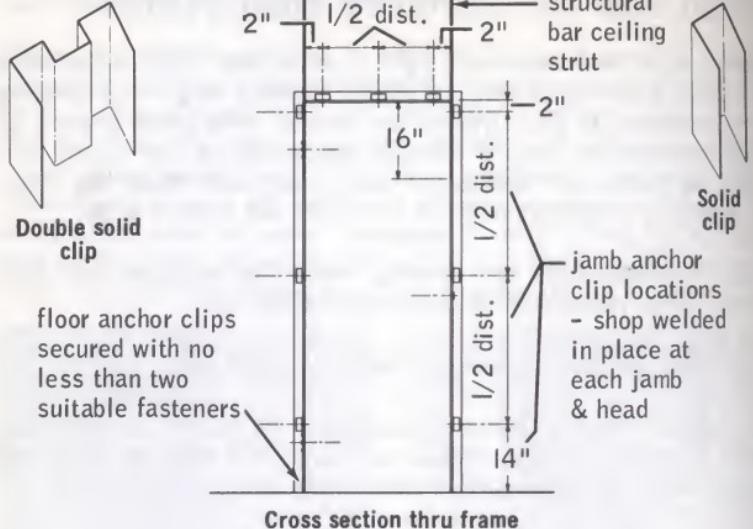
Floor anchor plates for door frames should be 14-ga. steel minimum, designed with two anchor holes to prevent rotation, and shop welded to trim flanges in order to dampen door impact vibrations. Floor anchorage should be by two power-driven anchors or equivalent per plate. Jamb anchor clips should be formed of 18-ga. steel minimum, welded in the jamb and head, and screw attached to the stud. A minimum of three anchor clips per jamb is recommended with the top clip located near the frame head (see details below).

Door closers and bumpers are required on all doors where the door weight (including attached hardware) exceeds 50 lbs.

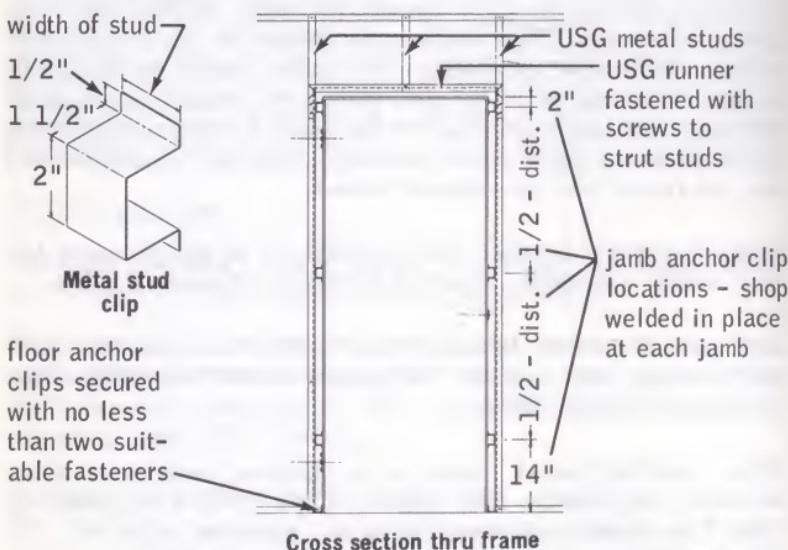
Door and borrowed light frames are not recommended when partitions are used as party walls, since the sound control characteristics will be reduced.

When installing metal frames in a partition using multi-layer wallboard application with PERF-A-TAPE Joint Compound or USG Laminating Adhesive, allowance must be made for the adhesive thickness which is 1/16" per adhesive line.

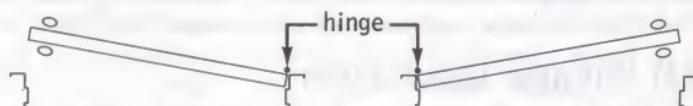
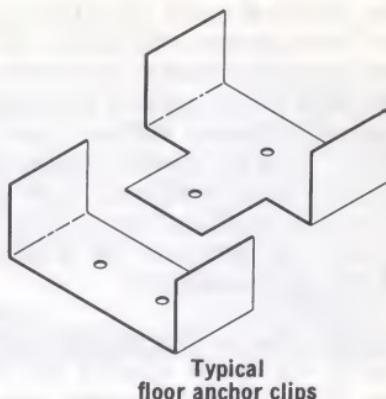
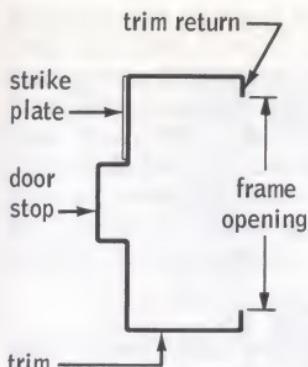
All metal door and borrowed light frames should be spot grouted at the location of the jamb anchor clips, after the coreboard or stud is installed but before the wallboard is erected. The grout should be raked out to allow the wallboard to be inserted into the frame.



Door frame struts are recommended for use with USG Semi-Solid, Solid and Double Solid drywall partitions. Struts should be $\frac{1}{4}$ " minimum thickness, hot rolled steel bar stock, and of sufficient width (minimum 1") to completely fill door stop void and anchor jamb securely. Struts should be welded to jambs a minimum of 16" below head and extend upward to the slab or a structural member where they are securely fastened.

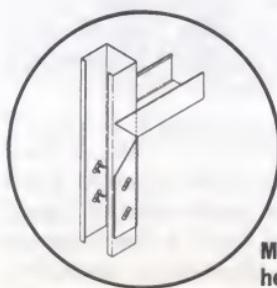


On the USG Studwall, Ribwall and Metal Stud drywall partitions, a USG Metal Stud acting as a strut-stud should be located adjacent to the jamb and securely screwed or bolted to the jamb anchor clips. A complete description for "Installation of Rough Framing" is shown.

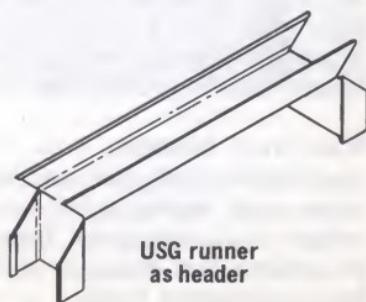


INSTALLATION OF ROUGH FRAMING

Door and borrowed light frames should be rough framed with metal studs and runners. Position floor to ceiling height strut-studs vertically adjacent to frames and anchor securely to top and bottom runners with the USG Metal Lock Fastener. Fabricate sill and header sections from DWR runners and install over less-than-ceiling-height door frames and above and below borrowed light frames. Fabricate from a cut-to-length section of runner with flanges slit and web bent to allow flanges to overlap adjacent vertical strut-studs, and securely attach to strut-studs with the USG Metal Lock Fastener (see detail). Fasten jamb anchor clips to strut-studs with two $\frac{3}{8}$ " USG Drywall Screws Type S-12, pan head. Install cut-to-length studs in the center above the door opening and above and below borrowed light openings spaced no greater than 24" o.c.



Mitered
head
splice

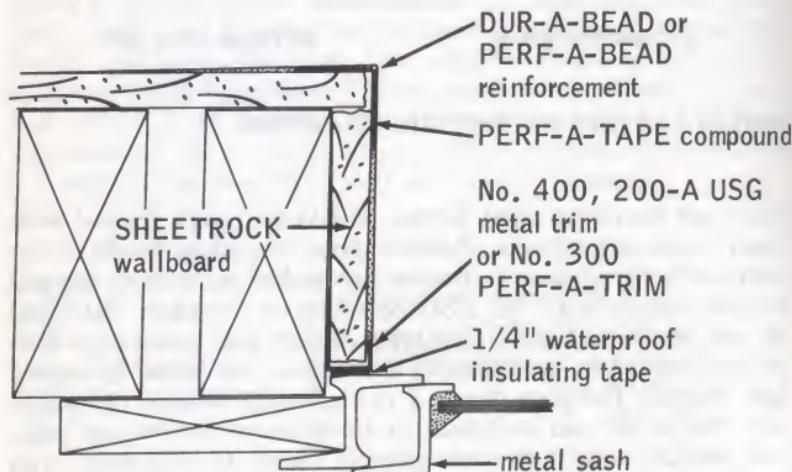


USG runner
as header

When installing metal door frames it is essential that partition enter frame opening (illustrated above) fully so that face layer of wallboard is enclosed by the trim and not butted against trim return. The frame opening measurement is critical, as too large a tolerance between wallboard and trim return will cause door frame to twist or vibrate against wallboard. Too small a tolerance will prevent wallboard from fully entering frame opening; as a result, the door frame will not be held securely by the partition. Measurement of partition thickness must include thickness of adhesive line.

When installing a three-piece knocked down door frame, allow space in the rough framing for the adjustment shoes in the frame. When ordering metal door frames, the many factors which must be considered include: the gauge of the frame; width and height of door opening; swing direction of door; type and thickness of door, and over-all thickness of partition.

Metal Window Installation



In conjunction with metal window installation, builders normally allow $\frac{1}{8}$ " to $\frac{1}{4}$ " space between metal windows and end of SHEETROCK Wallboard. This space is filled with caulking compound prior to painting. This method of installation allows moisture from condensation on metal window frame to penetrate into end of gypsum wallboard and, after a year or more, may result in paper delamination from the core. By placing No. 400 or No. 200-A USG Metal Trim, or No. 300 PERF-A-TRIM casing between window and board, protection will be provided against moisture penetrating the wallboard core.

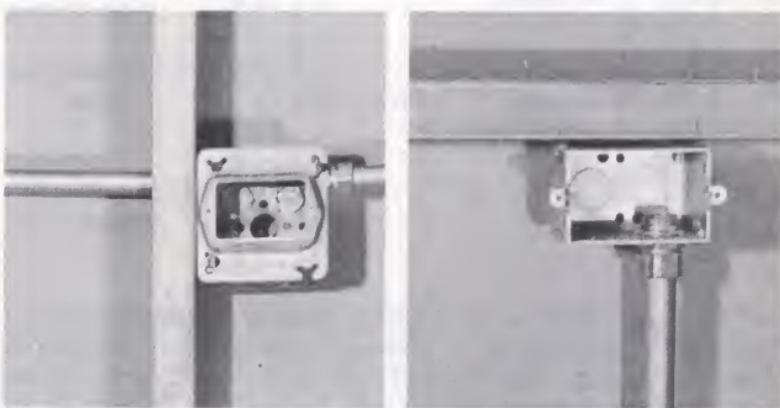
Waterproof insulating tape, $\frac{1}{32}$ " thick and $\frac{1}{4}$ " wide, is used to separate metal sash and metal trim and will provide some measure of insulation between the two different metals. Direct contact of an aluminum frame and metal trim in the presence of condensation moisture may cause an electrolytic deterioration of aluminum frame.

Electrical Fixture Installation



After electrical services have been roughed in and before wallboard is installed, cut necessary openings in coreboard, gypsum studs and openings in face layers of SHEETROCK to accept rigid conduct, flexible cable, electrical switches, outlet boxes, etc. To locate exact position of cut-out, hold SHEETROCK panel in place over electrical outlet. Tap with a rubber mallet or place a wooden block on the wallboard and tap on block around fixture with a hammer. The indentation on the wallboard is the guide for cutting. Remove the face panel and cut out opening with a keyhole saw or with specially designed cutting tools which produce die cut openings of the exact shape needed for various types of outlets. Erect panel in the usual manner.

Caulking—Where the partition is used as a sound barrier, apply a non-hardening caulking material to the backs of electrical boxes and around all boxes to seal the cut-out. Eliminate cutting holes back to back and adjacent to each other. Electrical boxes having a drywall ring or device cover for use as a stop in caulking are recommended.



Fixture Attachment

USG Drywall Partitions provide suitable anchorage for most types of fixtures normally found in residential and commercial construction. To insure satisfactory job performance it is important to have an understanding of particular fixture attachment so that sound control characteristics will be retained and at-

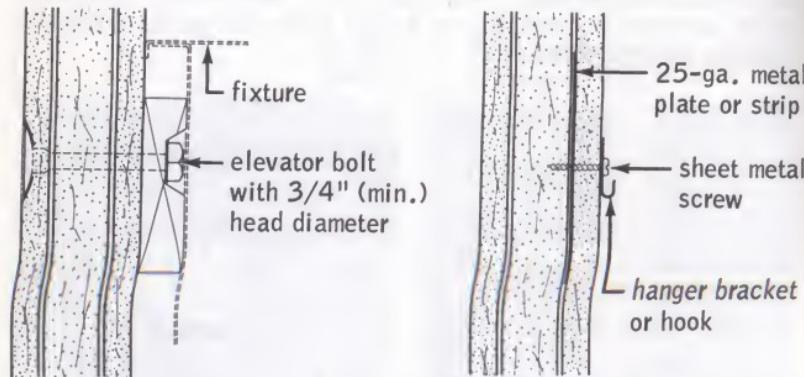
tachment will be within the allowable load-carrying capacity of the construction.

In wood frame construction, fixtures are usually attached directly to the framing or to blocking or supports attached to the framing. Blocking or supports should be provided for plumbing fixtures, towel racks, grab bars and similar items. Single or double layer SHEETROCK Wallboard is not designed to support loads imposed by these items without additional support to carry the main part of the load.

The attachment of fixtures to sound barrier partitions may impair the sound control characteristics. Only lightweight fixtures should be attached to resilient wall surfaces constructed with the RC-1 Resilient Channel. Refrain from attaching fixtures to party walls so as to provide a direct path for sound to flow. Allow a space between the back of the fixture attachment and septum barrier in the USG Triple Solid Drywall Partition. Wallboard used in the ceiling is not designed to support light fixtures or troffers, air vents or other equipment. Separate supports should be provided.

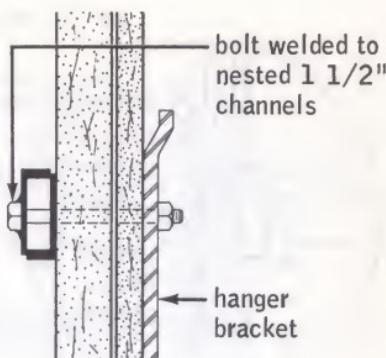
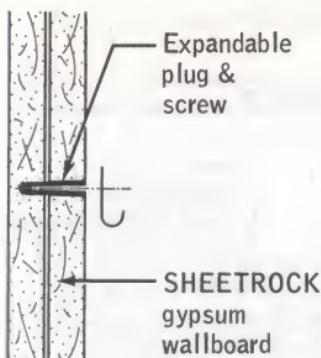
Fixture Attachment Types

To provide information for proper construction, an investigation of loading capacities of various fasteners and fixture attachments used with USG Drywall Partitions was conducted at the U.S.G. Research Center. The following fasteners or attachments were tested.



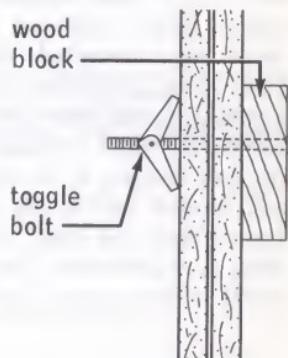
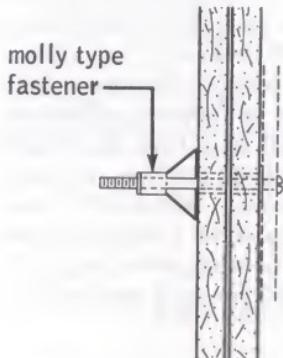
3/8" Elevator Bolt—a flat, plain, circular countersunk head bolt with a square neck to prevent rotation. Head diameter is slightly over three times that of bolt body. The large low head shape provides a flush wide bearing connection. Suitable in all laminated gypsum partitions for medium or heavy fixtures.

No. 8 Sheet Metal Screw—driven into 25 ga. minimum sheet metal plate or strip laminated between face board and core board or gypsum studs or ribs in laminated gypsum partitions. Also may be inserted through SHEETROCK Wallboard into a USG Metal Stud. Ideal for pre-planned light fixture attachment.



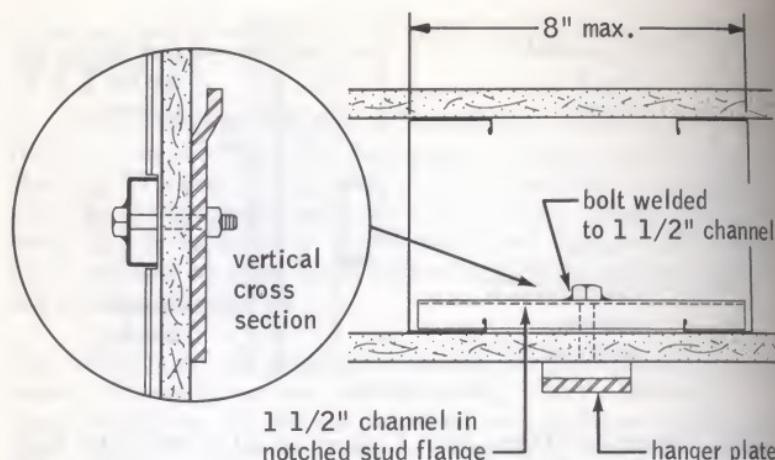
Plastic Expansion Plug—No. 8 sheet metal screw into 4-12 plastic plug. This anchor consists of a plastic tubular shield split at one end. A threaded hole in the center is provided to receive sheet metal screw. Annular ribs are provided on outside of plug to assure a positive grip in SHEETROCK. As screw is inserted, split end of plug expands (rear of plug) and holds assembly in place. Suitable for attaching lightweight fixtures in all partitions.

Bolt and Nested Channels—Bolt welded to nested 1½" channels for use in mounting hanger brackets for heavy fixtures. Suitable for use in USG Double Solid and Triple Solid Gypsum Drywall Partitions, provided that fixture attachments do not contact septum sound barrier.



Molly Bolt— $\frac{1}{4}$ " Molly Bolt installed in SHEETROCK Wallboard only. One advantage of this type fastener is that threaded section remains in wall when screw is removed. Also, wide spread spider support formed by the expanded anchor spreads load against wall material, increasing load capacity.

Toggle Bolt— $\frac{1}{4}$ " Toggle Bolt installed in SHEETROCK only. One disadvantage of toggle bolt is that when bolt is removed, wing fastener on back will fall down into a hollow wall. Another disadvantage is that a large hole is required to allow wings to pass through wall facings.



Bolt and 1½" Channel—Bolt welded to single 1½" channel and inserted in notches cut in USG Metal Stud for use in mounting hanger brackets for heavy fixtures. Suitable for use in USG Metal Stud Drywall Partition with DWS-358 Metal Studs.

Test results shown in following tables are recommended allowable loads under each condition of loading for partition system indicated. Recommended allowable load is an average of number of test loads applied to each fastener or attachment with a safety factor included. Caution must be exercised when using these recommended allowable loads. Withdrawal and shear tests were conducted on these fasteners because they are most extreme values that could be encountered in fixture attachment. However, there is rarely a true withdrawal or a true shear load on any fixture; it is usually a combination of the two. A hand rail would usually be subjected to a greater withdrawal load than a shearing load, but a wall cabinet more of a shearing load than a withdrawal load. This type of consideration must be made before a safe load can be determined for each application.

Fasteners were tested on small samples of partitions; therefore, consideration must be given when used with full size partitions. If, for example, an elevator bolt has been found to support a 250-lb. load for a given condition, a 750-lb. fixture would require three closely spaced elevator bolts. Although each bolt can safely carry 250 lbs., the partition is not necessarily capable of supporting 750 lbs. Spacing and grouping of each type fastener becomes a definite consideration. Tests were conducted on a short term basis and vibration (especially applicable to friction type fasteners), wetting, and long term installation considerations were not examined.

Fastener Load Tables

2" Solid Drywall Partition

Type Fastener or Attachment	Allowable Withdrawal Resistance—Lbs.	Allowable Shear Resistance—Lbs.
1. $\frac{3}{8}$ " Elevator Bolt	250	450
2. No. 8 sheet metal screw into 25-ga. sheet metal plate	60	100
3. No. 8 sheet metal screw in plastic plug	20	40

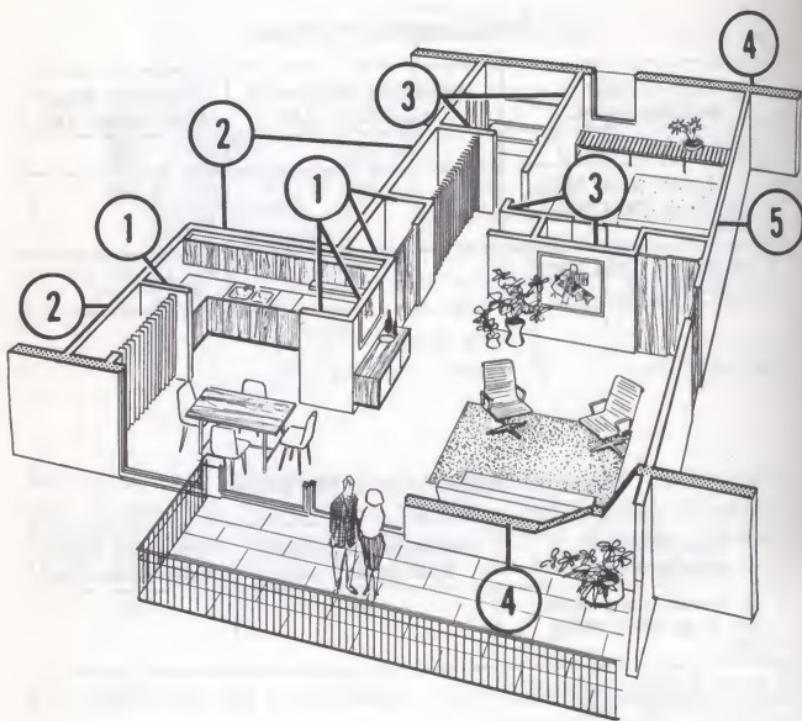
Double Solid Drywall Partition

Type Fastener or Attachment	Allowable Withdrawal Resistance—Lbs.	Allowable Shear Resistance—Lbs.
1. No. 8 sheet metal screw into 25-ga. sheet metal plate	60	100
2. Heavy Fixture attachment, using two $\frac{5}{16}$ " bolts	200	500
See Footnote*	Allowable Static Load—lbs.	Allowable Impact Load—ft. lbs.
3. Plumber's (Hanger) Bracket, using four $\frac{5}{16}$ " bolts	350	75

*Plumber's Bracket—two 4'x8' panels were constructed, and a simulated sink was attached to a plumber's bracket. Static and impact loads were applied to sink 18" from face of wall. Deflection readings were recorded for panel tested with static loads. A 60-lb. bag was dropped on a simulated sink at various heights, 18" from face of panel.

DWS-358 Metal Stud Drywall Partition

Type Fastener or Attachments	Allowable Withdrawal Resistance—Lbs.	Allowable Shear Resistance—Lbs.
1. No. 8 sheet metal screw through SHEETROCK into metal stud	50	80
2. $\frac{1}{4}$ " molly bolt in $\frac{1}{2}$ " SHEETROCK Wallboard only	35	80
3. $\frac{1}{4}$ " toggle bolt into $\frac{1}{2}$ " SHEETROCK only	40	60
4. No. 8 sheet metal screw in plastic plug	20	40
5. Heavy fixture attachment	70	250



Typical One-Bedroom Apartment Unit

- 1 2" Solid Partition
- 2 Double Solid Party Wall
- 3 2½" Metal Stud Partition
- 4 USG Furring Channels on masonry
- 5 3⅞" Metal Stud with 3" THERMAFIBER wool
blanket Corridor Partition

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CHAPTER

4

USG Drywall Systems

U.S.G. gypsum wallboards and accessories are perfectly matched to the wall and ceiling assemblies which have won for drywall a solid, fast-growing share of the apartment and non-residential construction market. U.S.G. has pioneered the development of such systems, and has perfected dozens of product applications specifically for this use.

These systems add new advantages to those which have enabled drywall to dominate residential construction. In high-rise and multiple-unit structures, drywall systems outperform other types, in *light weight, speed of installation, space saving, over-all economy, movability, and predecorated or easily decorated surfaces*. Through advanced "package" design, they now also meet most requirements—usually No. 1 in importance—for *fire resistance* and *sound transmission loss*. They should not be used where exposed to abnormal moisture or excessively high humidity or temperature.

Major U.S.G. partition, ceiling, furring, and fireproofing systems are outlined on the following pages. Each system is described and illustrated in detail, with step-by-step instructions to simplify construction. Recommended applications and limitations are given together with a full list of materials needed. See Chapter 2 for complete information on products mentioned. See Chapter 3 for installation methods to use in applying various types of wallboard, fasteners, metal accessories, caulking and joint treatment.

Wood Stud Partitions

Single Layer—Wood Stud Partitions

In this basic load-bearing drywall partition SHEETROCK Gypsum Wallboard is either horizontally or vertically applied directly to conventional 2x4 wood studs. Attachment is by nails, screws or the adhesive nail-on method. Maximum stud spacing for $\frac{3}{8}$ " SHEETROCK is 16" o.c.; for $\frac{1}{2}$ " and $\frac{5}{8}$ " SHEETROCK, 24" o.c. To upgrade job quality, Back-Blocking, Double Nailing and Floating Interior Angles may be used. Joints and fasteners are finished with the PERF-A-TAPE or DURABOND Joint System.

The use of predecorated ULTRAWALL or SHEETROCK Vinyl *Panels eliminates joint treatment and decorating. With Insulating (foil back) SHEETROCK Wallboard the system is effective as a vapor barrier, offers significant insulating value, and provides economical furring for exterior walls.*

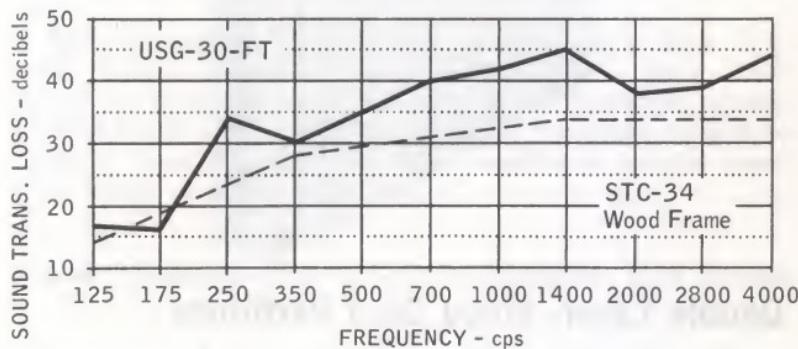
ADVANTAGES

Fire Resistance—1-hour rating with $\frac{5}{8}$ " SHEETROCK FIRECODE Wallboard.

Light Weight—6 to 7 psf for conventional assemblies.

Versatile—Widely accepted for interior partitions in all types of residential and commercial buildings where wood framing is used.

Economical—Quickly erected using low-cost materials.



MATERIALS

1. Gypsum Board—48" wide—($\frac{3}{8}$ ") ($\frac{1}{2}$ ") ($\frac{5}{8}$ ") thick Tapered Edge SHEETROCK (Regular) or (Insulating—foil back); ($\frac{1}{2}$) ($\frac{5}{8}$ ") thick SHEETROCK FIRECODE; $\frac{3}{8}$ " thick ULTRAWALL Panels (finish); $\frac{1}{2}$ " thick SHEETROCK Vinyl Panels (finish); $\frac{1}{2}$ " thick SHEETROCK W/R Wallboard—lengths as required.

2. Joint Treatment—PERF-A-TAPE or DURABOND Joint System.

3. Adhesive

—(for Back-Blocking System)—PERF-A-TAPE Joint Compound (embedding type).

—(for Adhesive Nail-On Board Application)—SHEETROCK Brand DWA-14 or DWA-10 Adhesive.

4. Fasteners

—Screws— $1\frac{1}{4}$ " USG Drywall Screw Type W.

—Nails (choose type from page 46).

5. Metal Trim (choose type from page 32).

6. SHEETROCK Metal Moldings (for ULTRAWALL and SHEETROCK Vinyl Panels)—to match finishes as required.

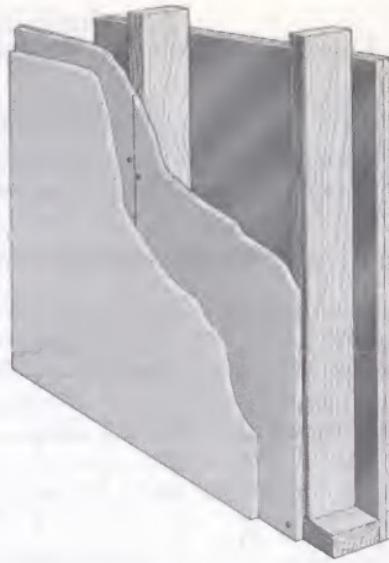
7. Corner Bead—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement (choose type from page 32).

8. Wallboard Sealant (for SHEETROCK W/R Wallboard)—SHEETROCK Brand W/R Sealant.

9. THERMAFIBER Insulating Wool Blankets (choose size from Chapter 2).

INSTALLATION

Install wallboard, fasteners, insulating wool, metal accessories and joint treatment according to methods shown in Chapter 3.



Double Layer—Wood Stud Partitions

In these load-bearing partitions a base layer of SHEETROCK Wallboard, BAXBORD Gypsum Backing Board or USG Wood Fiber Sound Deadening Board is nailed or screwed to 2x4 wood studs 16" o.c. The SHEETROCK face layer is job-laminated to the base layer. Surfaces are treated with the PERF-A-TAPE Joint System and decorated—these steps unnecessary when predecorated ULTRAWALL or SHEETROCK Vinyl Panels are used.

In double layer systems the reduced use of face layer fasteners results in finer appearance. To further reduce the possibility of nail popping and angle cracking, see *floating interior and exterior angle* construction (see details, page 80). Greater strength and higher fire and sound resistance are also found in these assemblies.

FIRE RATED CONSTRUCTION

2 layers $\frac{5}{8}$ " SHEETROCK FIRECODE Gypsum Wallboard each side of 2x4 wood studs 16" o.c.; base layer vertically applied and attached with 6d nails 6" o.c.; face layer horizontally applied and laminated to base; all joints staggered; joints finished.

Other double layer assemblies providing different combinations of sound and fire resistance are available (see Chapter 5).

ADVANTAGES

2-hour Fire Rating with double layer $\frac{5}{8}$ " thick wallboard.

Finer Appearance—Fewer chances for fastener defects; callbacks reduced; easily decorated.

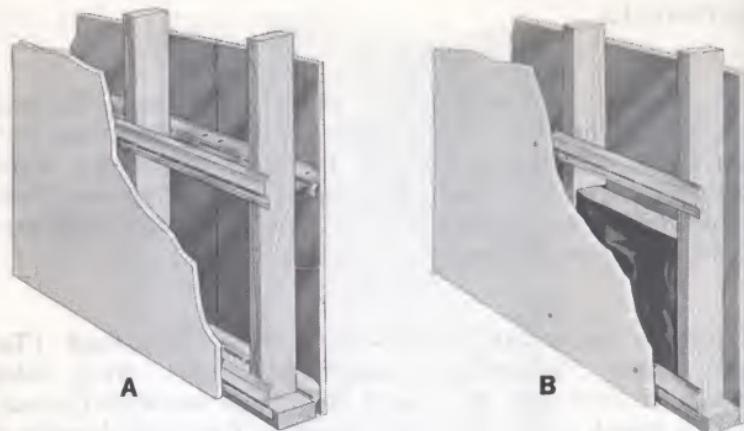
Fast Erection—cuts building time, permits earlier occupancy.

MATERIALS

- 1. Faceboards**—48" wide—(3/8") (1/2") (5/8") thick Tapered Edge SHEETROCK; (1/2") (5/8") thick SHEETROCK FIRECODE; 3/8" thick ULTRAWALL panels (finish); 1/2" thick SHEETROCK Vinyl Panels (finish); 1/2" thick SHEETROCK W/R Gypsum Wallboard—lengths as required. *Note: Use only 5/8" thick wallboard for fire rated construction.*
- 2. Backing Board**—48" wide—(3/8") (1/2") (5/8") thick (Tapered Edge) (Insulating) SHEETROCK; (1/2") (5/8") thick SHEETROCK FIRECODE; (3/8") (1/2") (5/8") thick BAXBORD Gypsum Backing Board; (1/2") (5/8") thick BAXBORD FIRECODE; lengths as required. *Note: Use only 5/8" thick wallboard for fire rated construction.*
- 3. Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.
- 4. Laminating Adhesive**—USG Laminating Adhesive or PERF-A-TAPE Joint Compound (embedding type).
- 5. Fasteners**
 - Screws—1 1/4" USG Drywall Screw Type W.
 - Nails (choose type from page 46).
 - Staples—16 ga. flat galvanized wire, 1/2" wide, (1") (1 1/8") (1 1/4") long with divergent points.
- 6. Metal Trim** (choose type from page 32).
- 7. SHEETROCK Metal Moldings** (for ULTRAWALL and SHEETROCK Vinyl Panels)—to match finishes as required.
- 8. Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement (choose type from page 32).
- 9. Wallboard Sealant** (for SHEETROCK W/R Wallboard)—SHEETROCK Brand W/R Sealant.

INSTALLATION

Install wallboard, fasteners, metal accessories, caulking and joint treatment according to methods described in Chapter 3.



Resilient Channel—Wood Stud Partitions

The resilient attachment of wallboard to wood studs with the RC-1 Resilient Channel provides excellent sound isolation—equal to the best direct attachment systems—at lower cost. The RC-1 Resilient Channels are attached 24" o.c. at right angles to the studs with nails or screws; wallboard is screw-attached with 1" USG Drywall Screws Type S.

FIRE AND SOUND RATED CONSTRUCTION

Construction (A): RC-1 Resilient Channels applied with 1 $\frac{1}{4}$ " USG Drywall Screws Type W or 6d nails to both sides of 2x4 wood studs 16" o.c.; $\frac{5}{8}$ " SHEETROCK FIRECODE face layers attached to channels with 1" USG Drywall Screws Type S 12" o.c.; wallboard end joints back-blocked; plates and perimeter caulked; joints finished. **Construction (B):** RC-1 Channels applied with 1 $\frac{1}{4}$ " USG Drywall Screws Type W or 6d nails to one side of 2x4 wood studs 16" o.c.; $\frac{5}{8}$ " SHEETROCK FIRECODE face layers attached to channels one side with 1" Type S screws 12" o.c., applied direct to studs other side with 1 $\frac{1}{4}$ " Type W screws 12" o.c.; 3" THERMAFIBER Insulating Wool Blankets between studs; plates and perimeter caulked; joints finished.

ADVANTAGES

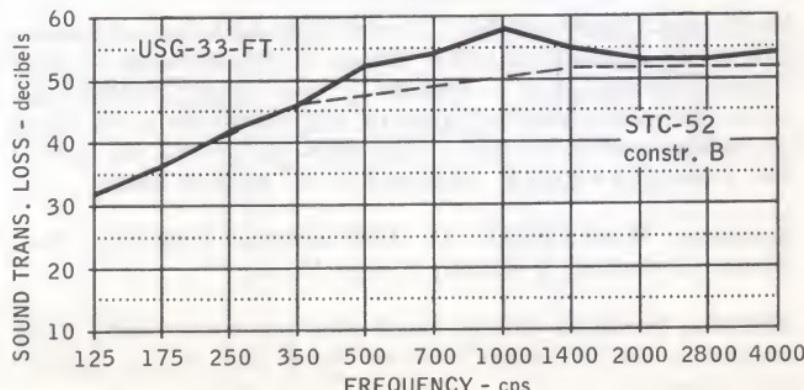
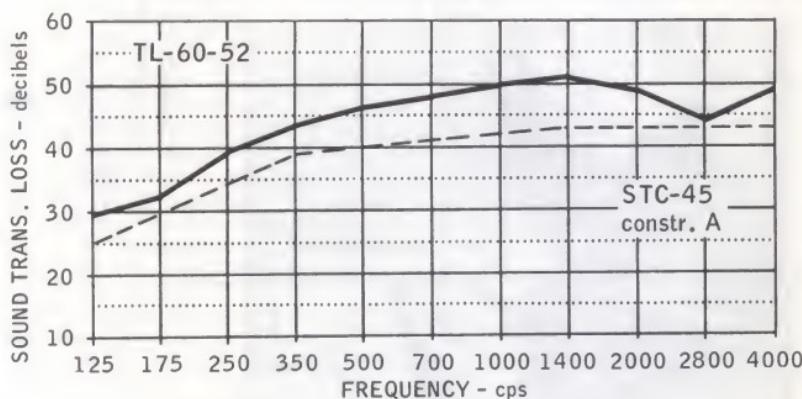
1-hour Fire Rating with Construction (A).

STC 52 with Construction (B), the best value for wood stud party walls.

Economy—Only three basic components required—resilient channels, drywall screws and wallboard. These simple parts erect quickly, to offer low-cost party walls.

MATERIALS

1. **Gypsum Board**—48" wide— $\frac{1}{2}$ " or $\frac{5}{8}$ " thick Tapered Edge SHEETROCK FIRECODE Wallboard—lengths as required.
2. **Resilient Channels**—RC-1 SHEETROCK Resilient Channels.
3. **Fasteners**
 - Screws—1" USG Drywall Screws Type S, 1 $\frac{1}{4}$ " USG Drywall Screws Type W.
 - Nails—6d c.c. cooler.
4. **Insulation**—THERMAFIBER Insulating Blankets, 3"x15"x96".
5. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.
6. **Adhesive**—(for Back-Blocking)—PERF-A-TAPE Joint Compound (embedding type).
7. **Metal Trim**—#200-A, #200-B, #401 or #402 USG Metal Trim.
8. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement (choose type from page 32).





INSTALLATION

Resilient Channels—attach RC-1 SHEETROCK Resilient Channels at right angles (horizontally) to wood studs. Use 1 $\frac{1}{4}$ " USG Drywall Screws Type W or 6d c.c. cooler nails driven through pre-punched holes in channel flange. Fasten channel to stud at each channel-stud intersection.

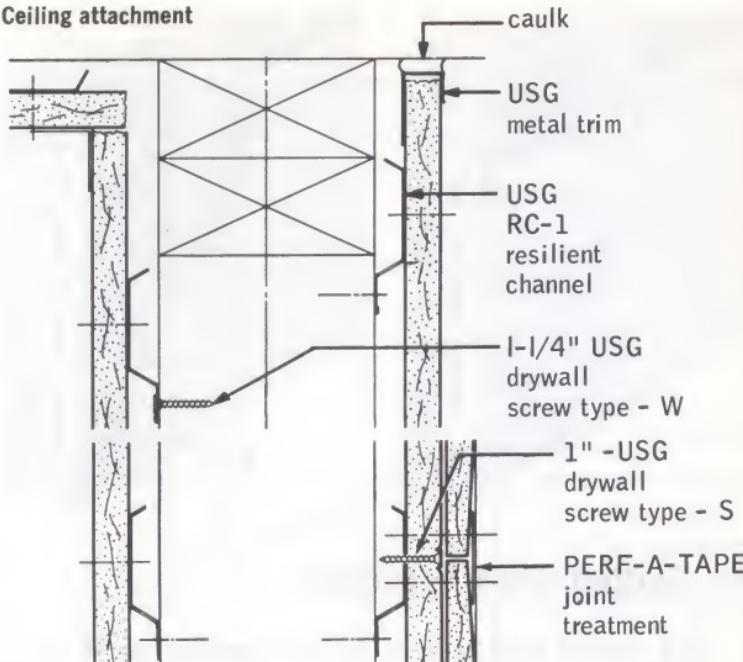
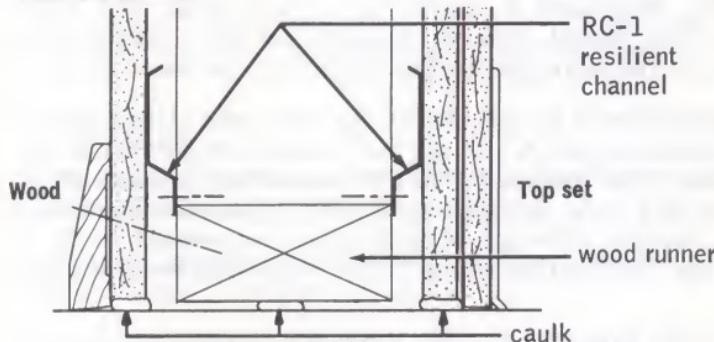
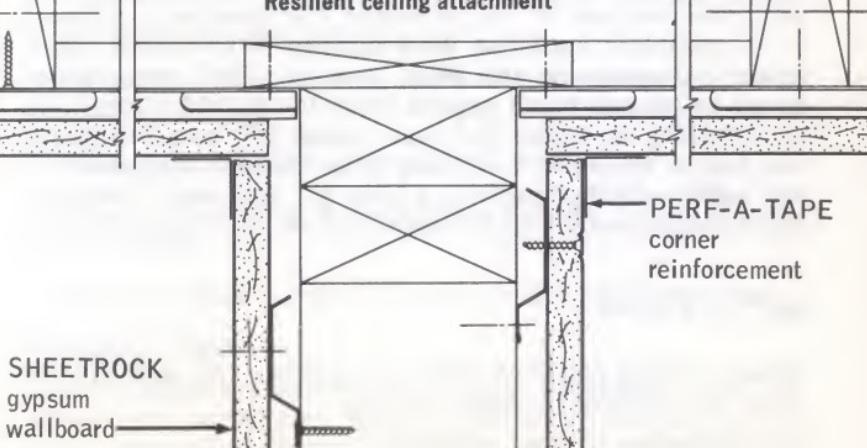
Position channel with nailing flange down. Locate channels at the floor, 24" up from floor, within 6" of the ceiling line and no more than 24" o.c. Extend channels into all corners and fasten to corner framing. Splice channel directly over studs by nesting the channels and fastening both flanges to the support.

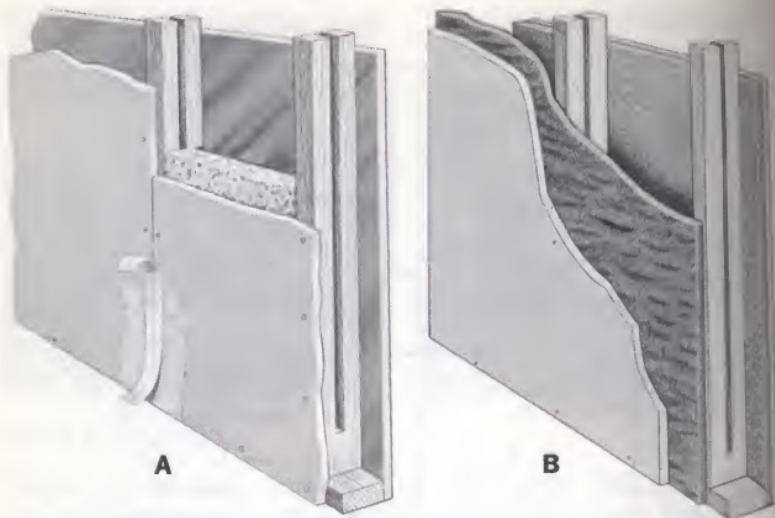


Wallboard—Apply wallboard horizontally with long dimension parallel to resilient channels. Attach wallboard with 1" USG Drywall Screws Type S spaced 12" o.c. along the channels. Center horizontal abutting edges of wallboard over screw flange of channel, and screw-fasten each edge. Back-block all vertical butt joints with a min. 8" wide strip of $\frac{3}{8}$ " gypsum board.

Insulating Wool—Install 3" THERMAFIBER Insulating Wool Blanket as directed in Chapter 3, page 112.

Finishing Partition—Apply metal trim and corner bead, caulk perimeter, treat all joints, fastener heads and trim as directed in Chapter 3.

Ceiling attachment**Floor attachment****Resilient ceiling attachment**



USG Slotted Stud Partitions

The USG Slotted Stud Systems provide the high sound isolation necessary in wood framed party walls. $\frac{5}{8}$ " SHEETROCK FIRECODE Wallboard is applied as a face layer over USG Wood Fiber Sound Deadening Board, or as a single layer backed by THERMAFIBER Insulating Blankets between the studs.

The slotted stud is a conventional 2x4 wood stud slotted lengthwise before erection. A $\frac{1}{8}$ " saw cut is made completely through the center of the $3\frac{1}{8}$ " face. The cut, extending to a minimum of 3" from stud ends, does not appreciably impair the stud's load bearing capacity. The use of slotted studs is covered by U. S. Patent No. 2,922,201 owned by United States Gypsum Company.

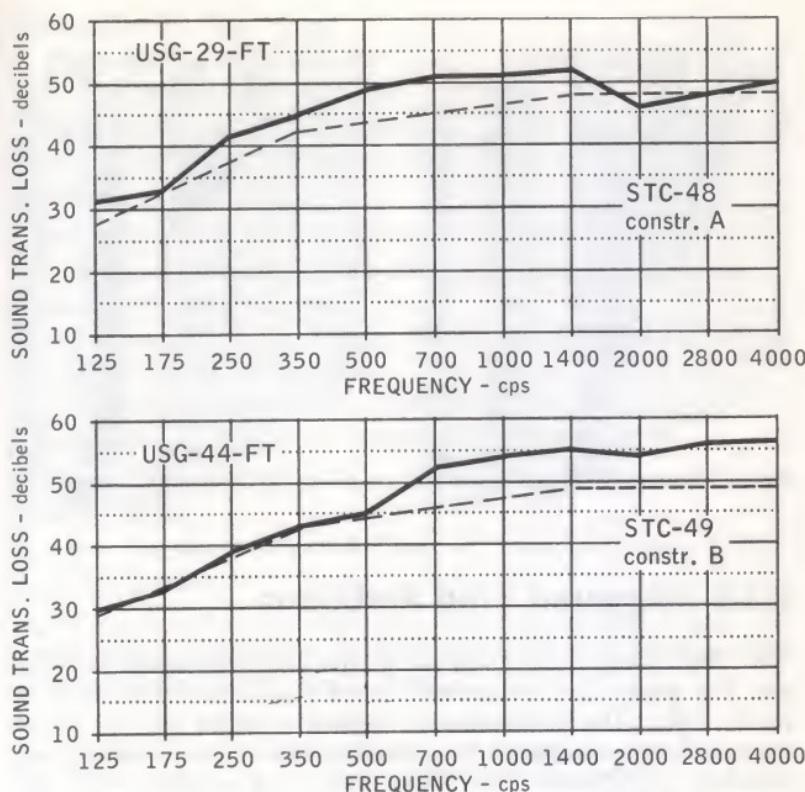
FIRE AND SOUND RATED CONSTRUCTION

Construction (A): $\frac{5}{8}$ " SHEETROCK FIRECODE Wallboard face layers vertically applied with joints staggered on opposite sides and screw-attached 16" o.c. to slotted 2x4 wood studs 16" o.c.; 3" THERMAFIBER Insulation Wool Blankets between studs; joints finished. **Construction (B):** Base layer $\frac{1}{2}$ " USG Wood Fiber Sound Deadening Board applied vertically with 5d coated nails to each side of slotted 2x4 wood studs 16" o.c.; base layer attached to studs 12" o.c. along perimeter and at quarter and mid points in field of panel; face layer $\frac{5}{8}$ " SHEETROCK FIRECODE applied horizontally with 6d coated nails 8" o.c.; joints finished.

ADVANTAGES

Sound Control—STC 48 with Construction (A) and STC 49 with (B)—suitable for party wall use.

Fire Resistance—1-hour estimated.

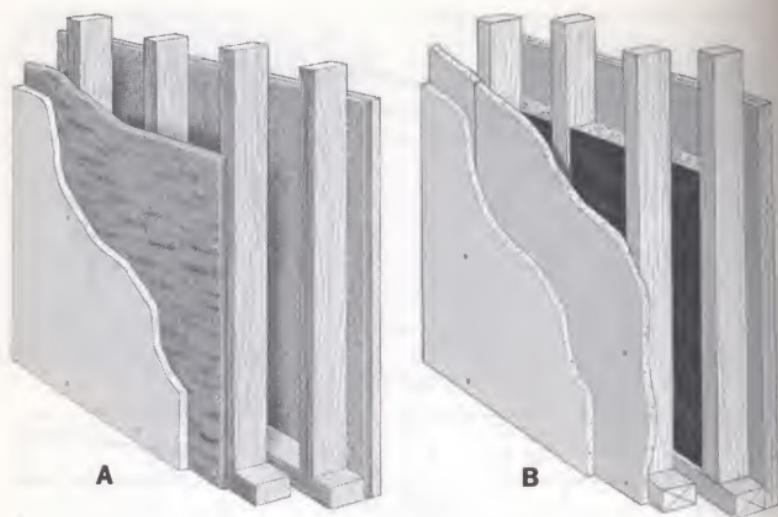


MATERIALS

1. **Faceboards**—48" wide— $\frac{5}{8}$ " thick Tapered Edge SHEETROCK FIRECODE Wallboard—lengths as required.
2. **Backing Board**— $\frac{1}{2}$ " USG Wood Fiber Sound Deadening Board, 48" wide—lengths as required.
3. **Fasteners**
 - Screws— $1\frac{1}{4}$ " USG Drywall Type W.
 - Nails—(for Construction (B)) 5d coated (for base layer); 6d coated (for face layer).
4. **Insulation**—THERMAFIBER Open Faced Insulating Wool Blankets, 3"x15"x96".
5. **Metal Trim**—#200A or #400 USG Metal Trim.
6. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.
7. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.

INSTALLATION

Install wallboard, insulating wool, sound deadening board, fasteners, metal accessories, caulking and joint treatment according to methods described in Chapter 3.



USG Staggered Stud Partitions

The USG Staggered Stud systems offer excellent sound isolation and fire protection for drywall wood frame partitions used as party walls. The load-bearing framing consists of 2x3 wood studs 16" o.c., staggered on opposite sides of the partition and attached to separate 2x3 plates spaced 1" apart. With $\frac{5}{8}$ " SHEETROCK FIRECODE laminated to a base layer of sound deadening board, this system provides optimum sound isolation, STC 53, and a 1-hour fire resistance rating. Where a fire rating is not required, single layer $\frac{5}{8}$ " SHEETROCK FIRECODE facings and 2" THERMAFIBER Blankets between studs on one side will give the best value in this type party wall.

FIRE AND SOUND RATED CONSTRUCTION

Construction (A): Two rows 2x3 staggered wood studs 16" o.c. on separate plates 1" apart; base layer of $\frac{1}{2}$ " USG Wood Fiber Sound Deadening Board applied vertically both sides; base layer attached with 6d coated nails 12" o.c. around perimeter and at quarter and mid-points in field of panel; $\frac{5}{8}$ " SHEETROCK FIRECODE face layer applied horizontally both sides and attached with 7d coated nails 7" o.c.; joints finished. **Construction (B):** Staggered studs same as in (A); $\frac{5}{8}$ " SHEETROCK FIRECODE face layer applied vertically both sides and attached with 1 $\frac{1}{4}$ " USG Drywall Screws Type W spaced 16" o.c.; 2" THERMAFIBER Insulating Wool Blankets inserted between studs on one side; joints finished.

ADVANTAGES

Sound Control—STC 53 with Construction (A) and STC 51 with (B)—ideal for party walls.

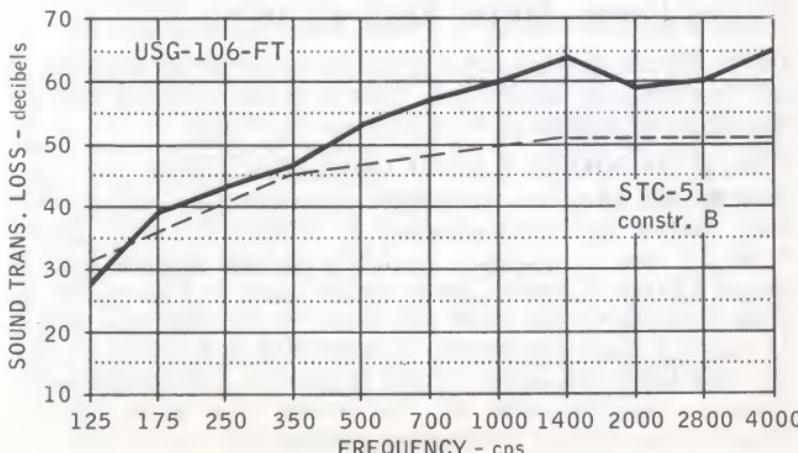
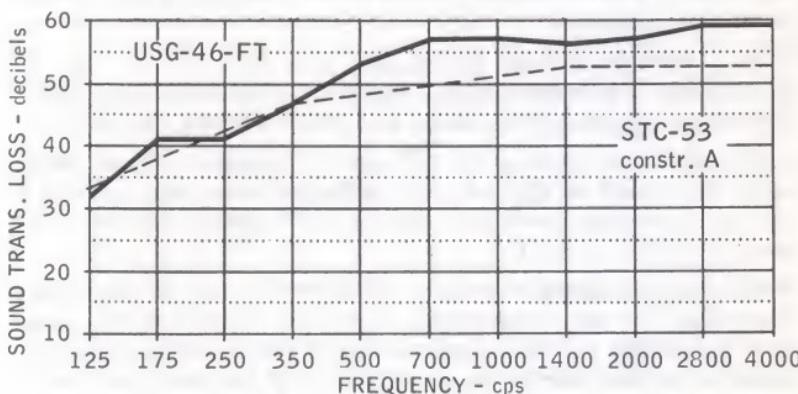
Fire Resistance—1-hour rating with (A).

MATERIALS

1. **Faceboards**—48" wide— $\frac{5}{8}$ " thick Tapered Edge SHEETROCK FIRECODE Wallboard—lengths as required.
2. **Backing Board**— $\frac{1}{2}$ " USG Wood Fiber Sound Deadening Board, 48" wide—lengths as required.
3. **Fasteners**—
 - Screws—1 $\frac{1}{4}$ " USG Drywall Screw Type W.
 - Nails—(for Construction A) 6d coated (for base layer)
7d coated (for face layer).
4. **Adhesive**—USG Laminating Adhesive or PERF-A-TAPE Joint Compound (embedding type).
5. **Insulation**—THERMAFIBER Insulating Blankets, 2"x15"x96"
6. **Metal Trim**—# 200A or # 400 USG Metal Trim.
7. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.
8. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.

INSTALLATION

Install wallboard, insulating wool, sound deadening board, fasteners, metal accessories, caulking and joint treatment according to methods described in Chapter 3.





USG Metal Stud Partitions

USG Metal Stud Partitions are lightweight, non-load bearing assemblies that have won wide acceptance for their low cost, speedy erection, fire and sound resistant properties. They consist of steel channel studs, set in floor and ceiling runner tracks and faced each side with one or two layers of SHEETROCK Gypsum Wallboard, screw-attached. Screw heads and joints are finished with joint treatment.

Studs, available in three widths, are used with $\frac{3}{8}$ ", $\frac{1}{2}$ " or $\frac{5}{8}$ " SHEETROCK Wallboard facings applied horizontally or vertically depending on job layout, sound and fire resistance required.

Maximum stud spacing is 24" o.c. *Exception:* Where single layer $\frac{3}{8}$ " board is applied each side, maximum stud spacing is 16" o.c. Limiting partition heights: 1 $\frac{5}{8}$ " metal stud, 9'; 2 $\frac{1}{2}$ " stud, 12'; 3 $\frac{5}{8}$ " stud, 16'.

Metal stud partitions offer some of drywall's best performances. Depending on the construction used (see details below), metal stud assemblies are ideal space-saving dividers within units, economical corridor partitions, or highly sound-resistant party walls.

Single Layer—Metal Stud Partition

These versatile systems offer a practical method of partitioning for corridors, or within units. Screw fasteners assure positive attachment of wallboard, freedom from nail "pops."

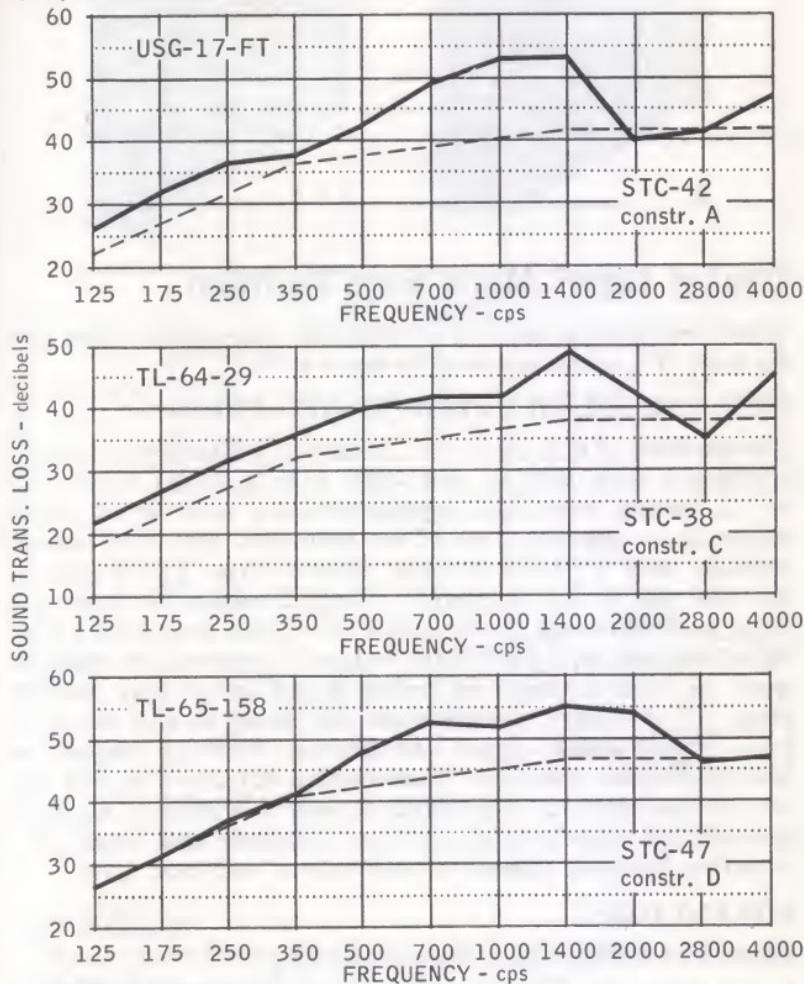
FIRE AND SOUND RATED CONSTRUCTION

Construction (A): $\frac{5}{8}$ " SHEETROCK FIRECODE face layers vertically applied and screw-attached to DWS-358 (3 $\frac{5}{8}$ ") Metal Studs 24" o.c. in runners; 1" USG Drywall Screws Type S spaced 8" o.c. at vertical joints and 12" o.c. in field of board; joints finished. **Construction (B):** Same as (A) but with DWS-212 (2 $\frac{1}{2}$ ") Studs in runners. **Construction (C):** Same as (A) but with DWS-158 (1 $\frac{5}{8}$ ") Studs in runners. **Construction (D):** Same as (A) but with $\frac{1}{2}$ " SHEETROCK face layers and 1" THERMAFIBER Sound Attenuation Blankets in stud cavity.

ADVANTAGES

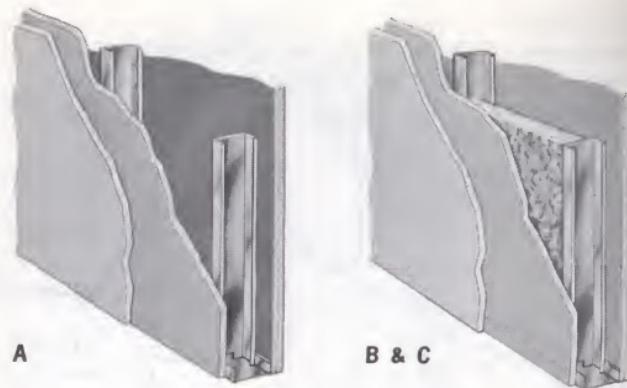
Fire Resistance—1-hour rating for Construction (A) & (C); 1-hour estimated for (B) based on performance of (C).

Sound Control—42 STC with Construction (A); 38 STC with (C); 47 STC with (D).



MATERIALS

- USG Metal Studs**—DWS-158(1½"), 212(2½"), 358(3½").
 - USG Runners**—DWR-158 (1½"), 212 (2½"), 358 (3½").
 - Faceboards**—48" wide—(¾") (½") (⅜") thick Tapered Edge SHEETROCK or (½") (⅜") thick SHEETROCK FIRECODE Wallboard—lengths as required. Note: Use only ⅜" thick wallboard for fire-rated construction.
 - Fasteners**—USG Drywall Screws—1" Type S, ¾" Type S-12, pan head.
 - Metal Trim**—choose type from page 32).
 - Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.
 - Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.
 - Insulation**—THERMAFIBER Sound Attenuation Blankets 1"x 24"x48".
- See page 144 for installation of system.



Double Layer—Metal Stud Partition

These double layer systems are excellent for corridors and give the high STC value necessary for party walls.

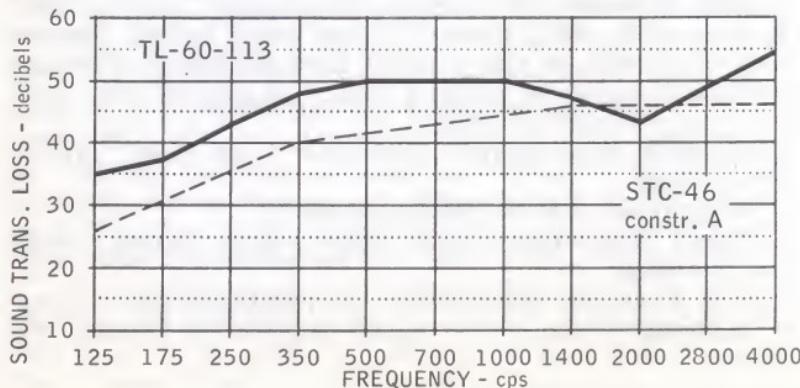
FIRE AND SOUND RATED CONSTRUCTION

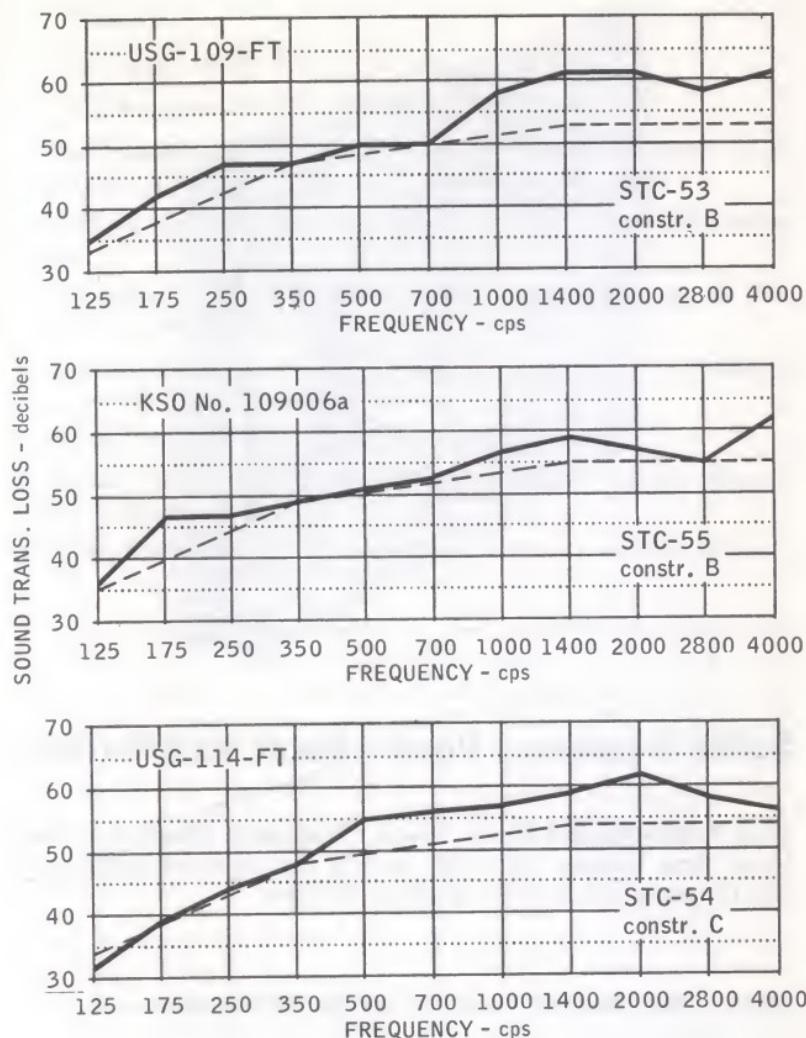
Construction (A): 2 layers $\frac{5}{8}$ " SHEETROCK FIRECODE Gypsum Wallboard each side of DWS-358 ($3\frac{5}{8}$ ") Metal Studs 24" o.c. in runners; base layer applied vertically with vertical joints staggered on opposite sides of the partitions; base layer screw-attached with 1" USG Drywall Screws Type S, 12" o.c. in the field and 8" o.c. staggered at vertical edges; face layer applied vertically with joints offset 12" from base layer; face layer laminated with PERFA-TAPE Joint Compound (embedding type) or USG Laminating Adhesive and temporarily held in place; joints finished. **Construction (B):** Same as (A) but with 1 $\frac{1}{2}$ " THERMAFIBER Sound Attenuation Blankets stapled to back side of one base layer. **Construction (C):** Same as (A) but with double layer $\frac{1}{2}$ " SHEETROCK FIRECODE Wallboard attached to DWS-212 (2 $\frac{1}{2}$) Studs; and $\frac{1}{2}$ " THERMAFIBER Sound Attenuation Blankets stapled to back side of one base layer.

ADVANTAGES

2-hour Fire Rating with Construction (A).

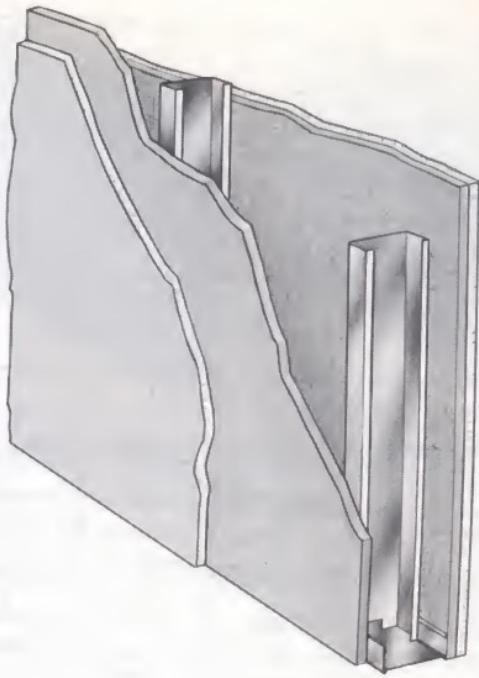
Sound Control—55 STC (job test), 53 STC (lab test) with Construction (B); 54 STC with (C); 46 STC with (A).





MATERIALS

1. **USG Metal Studs**—DWS-212 (2½"), 358 (3½").
 2. **USG Runners**—DWR-212 (2½"), 358 (3½").
 3. **Faceboards**—48" wide, ½" or ⅝" thick Tapered Edge SHEETROCK FIRECODE Wallboard—lengths as required.
 4. **Backing Board**—½" or ⅝" thick, 24" or 48" wide BAXBORD FIRECODE, 8' lengths.
 5. **Fasteners**—USG Drywall Screws 1" Type S, 1½" Type G, and ¾" Type S-12, pan head.
 6. **Adhesive**—PERF-A-TAPE Joint Compound (embedding type) or USG Laminating Adhesive.
 7. **Metal Trim**—choose type from page 32).
 8. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.
 9. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.
 10. **Insulation**—THERMAFIBER Sound Attenuation Blankets 1½" x 24" x 48".
- See page 144 for installation of system.



Sound Deadening Board—Metal Stud Partition

With USG Mineral Fiber Sound Deadening Board as a base layer these systems offer light weight and effective sound control for party and corridor walls at low cost.

FIRE AND SOUND RATED CONSTRUCTION

Construction (A): $\frac{5}{8}$ " SHEETROCK FIRECODE Wallboard face layer and $\frac{1}{2}$ " thick USG Mineral Fiber Sound Deadening Board base layer applied each side DWS-358 ($3\frac{5}{8}$ ") Metal Studs 24" o.c. in runners; both boards applied vertically with joints staggered; base layer screw-attached with 1" USG Drywall Screws Type S; face layer laminated and attached with $1\frac{5}{8}$ " Type S screws; joints finished. **Construction (B):** Same as (A) but with $\frac{1}{2}$ " SHEETROCK FIRECODE face layers applied to DWS-158 ($1\frac{5}{8}$ ") Metal Studs in runners.

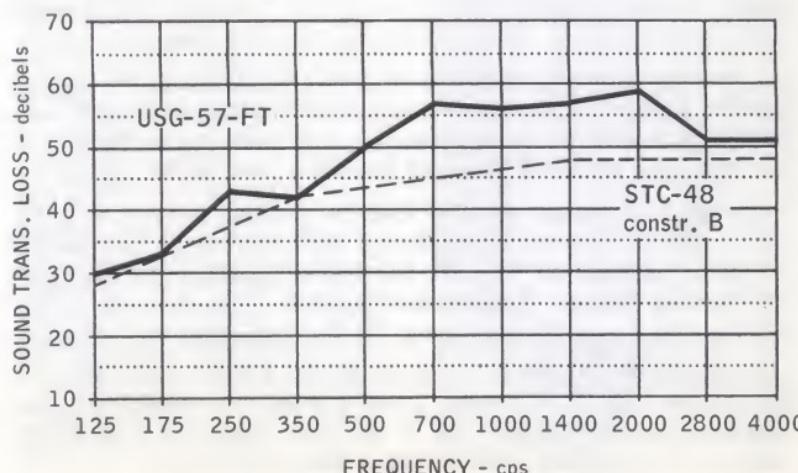
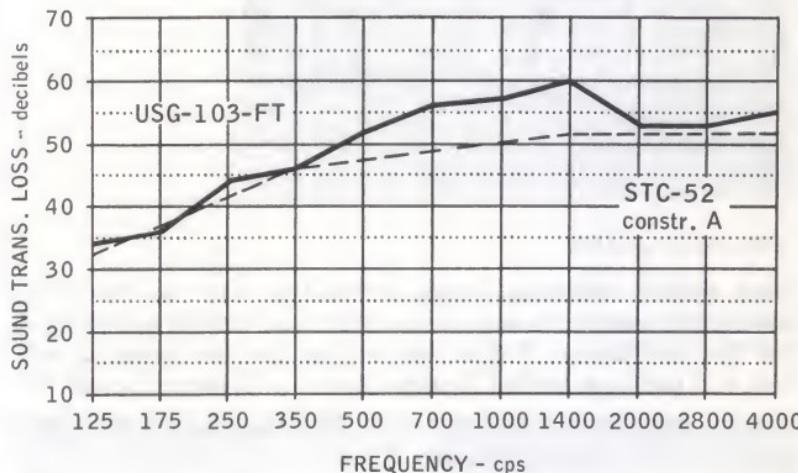
ADVANTAGES

1-hour Fire Rating with Construction (B); 1-hour (est.) for (A) based on performance of (B).

STC 52 with Construction (A), job test STC 50; STC 48 with (B).

MATERIALS

1. **USG Metal Stud**—DWS-158 (1½"), 358 (3½").
2. **USG Runners**—DWR-158 (1½"), 358 (3½").
3. **Faceboards**—48" Wide, ½" or 5/8" thick Tapered Edge SHEETROCK FIRECODE Wallboard—lengths as required.
4. **Backing Board**—½" USG Mineral Fiber Sound Deadening Board.
5. **Fasteners**—USG Drywall Screws, 1" and 1½" Type S, 3/8" Type S-12, pan head.
6. **Adhesive**—PERF-A-TAPE Joint Compound (embedding type) or USG Laminating Adhesive.
7. **Metal Trim**—(Choose type from page 32).
8. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.
9. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.





INSTALLATION

Stud System Erection—Align DWR-158, 212, or 358 USG Metal Runners accurately at the floor and ceiling according to the partition layout. Follow instructions for positioning, attaching, and caulking behind runners shown in Chapter 3, page 110.

Install rough framing around door and borrowed light frames as described in Chapter 3, page 115.

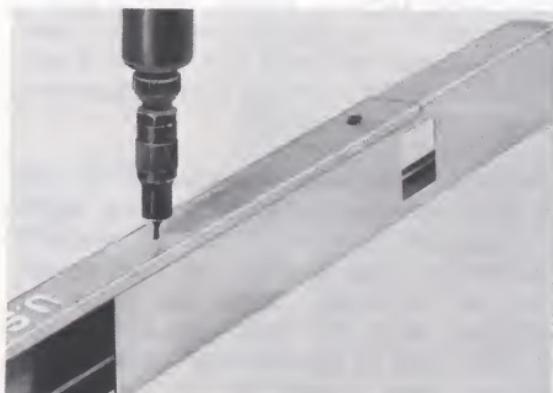
Insert floor-to-ceiling height DWS-158, 212, or 358 USG Metal Studs between runners, twisting them into position. Space studs 24" o.c. (except 16" o.c. for single layer $\frac{3}{8}$ " wallboard).

At partition corners, install a stud so that it forms the outside corner. Follow application of base layer wallboard to this stud, install second stud in the abutting run and screw-attach web through base layer to flange of first stud (see detail page 147).

Place studs in direct contact with all abutting partitions, partition corners and other construction. Where there is a possibility of water penetration through the walls, install an asphalt protection strip between the stud and the wall.

Anchor all studs adjacent to door and borrowed light frames, partition intersections and corners to the floor and ceiling runners. Use the USG Metal Lock Fastener or positive screw attachment with $\frac{3}{8}$ " Type S-12, pan head, drywall screw through each stud flange and runner flange.

USG Metal Studs may be conveniently spliced together when required. To splice two studs, nest one into the other to a depth of at least 8". One flange of each stud must be in between two flanges of mating stud so studs interlock. Fasten together with two $\frac{3}{8}$ " Type S-12, pan head screws in each flange. Locate each screw no more than 1" from ends of splice.



Wallboard Erection—Apply gypsum wallboard with the long dimension parallel (or at right angles) to studs. Position board so all abutting ends and edges (except edges with horizontal application) will be located in center of stud flanges. Be certain joints are neatly fitted and staggered on opposite sides of the partition so they occur on different studs. Cut wallboard to fit neatly around all outlets and switch boxes.

For vertical single-layer wallboard application, fasten wallboard with 1" USG Drywall Screws Type S spaced a maximum of 12" o.c. in field of board and 8" o.c. along vertical abutting edges. Stagger screws on abutting edges or ends.



For horizontal single-layer wallboard application and where fire rating is not required, fasten wallboard with 1" USG Drywall Screws Type S spaced a maximum of 12" o.c. in the field of the board and 12" o.c. along the abutting end joints.

For two-layer job laminated construction, apply the base layer vertically with 1" USG Drywall Screws Type S spaced 12" o.c. in field of board and 8" o.c., staggered at vertical joints of the board. Apply the face layer vertically with vertical joints, laminate and hold in place with 1½" Type G drywall screws or with temporary fastening until adhesive is dry.

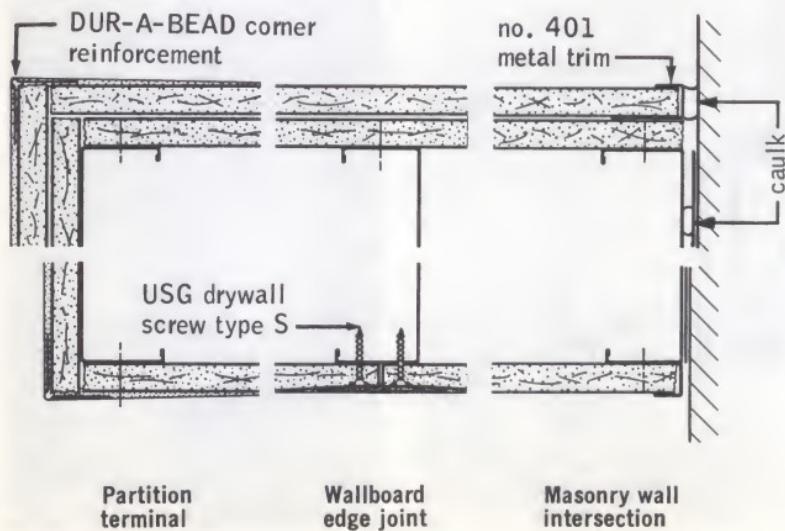
For two-layer construction with screw attachment of the face layer, apply the base layer vertically with vertical joints staggered on opposite sides of the partition and screw-attach with 1" USG Drywall Screws Type S spaced 16" o.c. in the field and vertical joints of the board. Apply the face layer vertically with vertical joints offset 24" from base layer joints and staggered on opposite sides of the partition. Attach with 1½" USG Drywall Screws Type S spaced 16" o.c. in the field and vertical joints of the board.

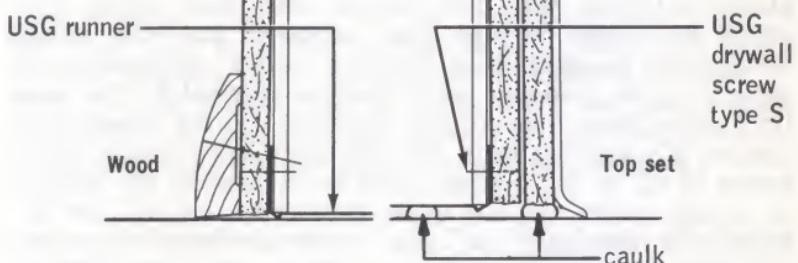
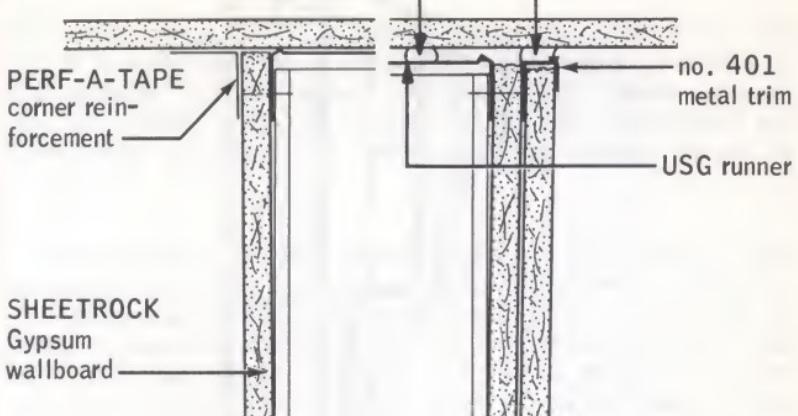
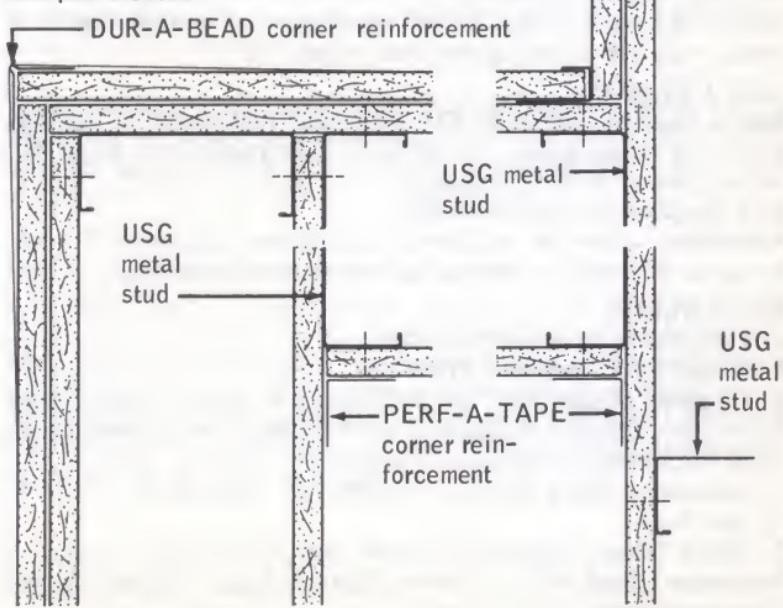
Sound Deadening Board—Install ½" USG Mineral Fiber Sound Deadening Board as directed in Chapter 3, page 113.

Insulating Wool—Install 1½" THERMAFIBER Sound Attenuation Blankets and 3" THERMAFIBER Insulating Wool Blankets as directed in Chapter 3, page 112.

Finishing Partition—Apply metal trim and cornerbead, caulk perimeter, treat all joints, fastener heads and trim as directed in Chapter 3.

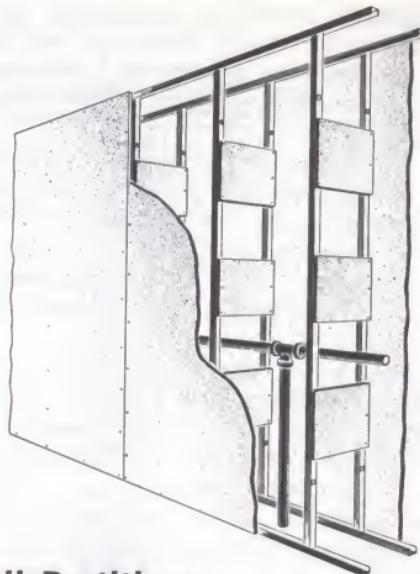
Wall plan sections



Floor and ceiling attachments**Wall plan sections**

Partition corner

Partition "T"



Chase Wall Partitions

Metal Stud-Chase Wall partitions are used where greater core widths are needed for pipe chase enclosures and other service installations. Net pipe chase widths up to $8\frac{3}{4}$ " are available by using the same materials and techniques required for the basic USG Metal Stud system. This non-load bearing construction consists of a double row of $1\frac{5}{8}$ " Metal Studs in runners. Cross braces of $\frac{1}{2}$ " or $\frac{5}{8}$ " gypsum board by chase width are installed at quarter points of the studs. Face layers of $\frac{1}{2}$ " or $\frac{5}{8}$ " SHEETROCK Wallboard and cross braces are screw attached to the studs. Joints are treated with the PERF-A-TAPE Joint System but may be left untreated if SHEETROCK W/R Wallboard is used as a base for the adhesive application of ceramic, metal or plastic wall tile. Limiting partition height: 10'.

ADVANTAGES

Sound Control—40 to 45 STL estimated (for single $\frac{5}{8}$ " facings and up to 9" air space); 45 to 50 STL estimated (for single $\frac{5}{8}$ " facings and 9" to 12" air space).

Fire Resistance—Incombustible.

Versatility—Provides variable chase widths. Adaptable for use as party or corridor walls in all metal stud partitions.

MATERIALS

1. **USG Metal Studs**—DWS-158.
2. **USG Metal Runners**—DWR-158.
3. **Gypsum Board**— $\frac{1}{2}$ " or $\frac{5}{8}$ " thick, 4' wide Tapered Edge SHEETROCK Gypsum Wallboard or $\frac{1}{2}$ " thick, 4' wide, SHEETROCK W/R Wallboard—lengths as required.
4. **Fasteners**—USG Drywall Screws—1" Type S, $\frac{3}{8}$ " Type S-12, pan head.
5. **Metal Trim**—(choose type from page 32).
6. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.
7. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.

INSTALLATION

Set metal runners—Align double rows of DWR-158 USG Metal Runners accurately at the floor and ceiling according to the partition layout. Spacing between outside flanges of each pair of runners must not exceed 12". Follow instructions for positioning, attaching and caulking behind runners shown in Chapter 3.

Position studs in runners—Insert DWS-158 USG Metal Studs into floor and ceiling runners and twist into position. Start stud spacing (maximum 24" o.c.) from same point in each row of studs so that any pair of studs will be directly opposite each other with their flanges pointing in the same direction. Anchor all studs to floor and ceiling runners with USG Metal Lock Fastener or $\frac{3}{8}$ " USG Drywall Screws Type S-12, pan head.

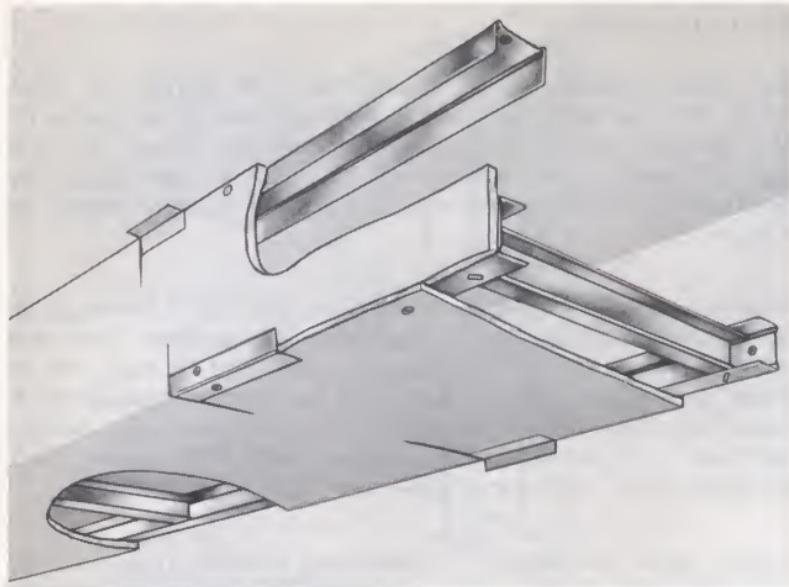
Attach cross bracing—Cut cross-brace sections from $\frac{1}{2}$ " or $\frac{5}{8}$ " SHEETROCK Wallboard a minimum 12" x distance between outer flanges of adjacent runners. Each pair of studs will require a minimum of 3 cross-braces located at quarter points with one brace at partition center height. Fasten first cross-brace at partition center height with a minimum of three 1" USG Drywall Screws Type S, along each stud web. Fasten other two cross-braces in same manner. Deviate from this procedure only where layout of pipes, ducts, etc., requires it.

Apply Wallboard—Apply $\frac{1}{2}$ " or $\frac{5}{8}$ " SHEETROCK Wallboard vertically with long dimension parallel to framing members. Fasten wallboard to studs with 1" USG Drywall Screws Type S, spaced 12" o.c. in field of board and 8" o.c., staggered, along vertical abutting edges.

Where a double layer installation is required, face layer can be laminated or mechanically attached to base layer. For either method, apply wallboard vertically or horizontally with face layer joints offset 24" from base layer joints.

For two-layer job-laminated construction, apply base layer as described above for single layer. Laminate face layer and hold in place with 1 $\frac{1}{2}$ " Type G drywall screws or with temporary fastening until adhesive is dry (see Chapter 3 for laminating procedure). For two-layer construction with face layer screw-attached, fasten base layer with 1" Type S and face layer with 1 $\frac{5}{8}$ " Type S drywall screws spaced 16" o.c. in field and along vertical abutting edges of board.

Finishing partition—Apply metal trim and corner bead; if sound control is required, caulk around all openings and partition perimeter; treat all joints; fastener heads and trim as directed in Chapter 3.



Drywall Soffit

The USG Drywall Soffit assembly consists of electro-galvanized steel channel runners and studs faced with SHEETROCK Gypsum Wallboard, screw attached. It is a lightweight, fast and economical method of filling over cabinets or lockers and of housing overhead ducts, pipes or conduits. The system permits constructing soffits with depth of 48" and widths to 72" without supplementary vertical studs.

Construction Recommendations—Maximum Dimension (1):

Gypsum Board Thickness (2)	Metal Stud Size	Maximum Width	Max. Depth for Max. Width Shown
½"	1 5/8"	60"	48"
½"	2 1/2", 3 5/8"	72"	36"
5/8"	1 5/8"	60"	30"
5/8"	2 1/2", 3 5/8"	72"	18"

- (1) The construction is not designed to support loads other than its own dead weight and should not be used where it may be subjected to excessive abuse.
- (2) The double-layer wallboard system and ¾" thick wallboard are not recommended for this construction.

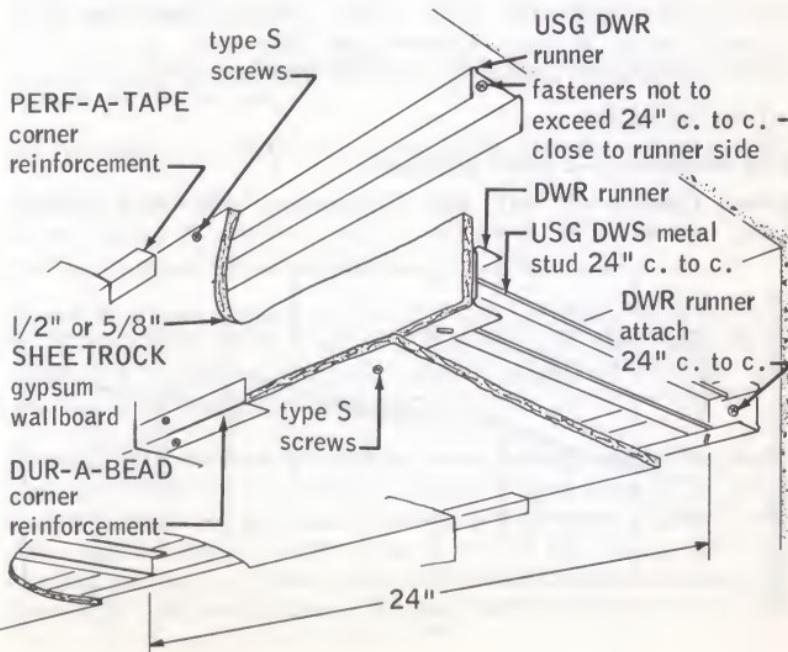
MATERIALS

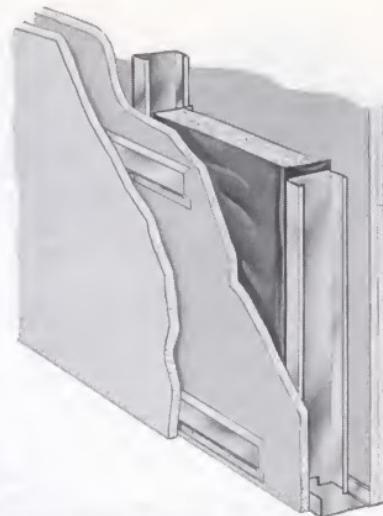
1. **USG Metal Studs**—DWS-158, 212, 358.
2. **USG Runners**—DWR-158, 212, 358.
3. **Gypsum Board**— $\frac{1}{2}$ " or $\frac{5}{8}$ " thick, 4' wide Tapered Edge SHEETROCK Gypsum Wallboard—lengths as required.
4. **Fasteners**—1" USG Drywall Screws Type S.
5. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.
6. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.

INSTALLATION

Align runners for drywall soffits accurately at the ceiling and side wall according to the layout. Attach runners to ceiling construction as shown in Chapter 3; place fastener close to outside face of runner. On stud walls, space fasteners to engage each stud.

Fasten vertical wallboard face panel to web of face corner runner and flange of ceiling runner with 1" USG Drywall Screws Type S spaced 12" o.c. Place screws in face corner runner at least 1" from edge of SHEETROCK panel. Insert metal studs between face corner runner and sidewall runner and attach alternate studs to runners with the USG Metal Lock Fastener. Attach bottom face panel to metal studs and runners with 1" Type S screws spaced 12" o.c. Finish soffit with corner bead and joint treatment.





Resilient Channel Partitions

The USG Metal Stud-Resilient Channel Drywall Partitions offer high-value sound-barrier efficiency in non-load bearing party walls. With two layers of wallboard on one side of the partition separated by the RC-1 Resilient Channel, these double layer systems have been tested at 50 STC or more. Limiting height: 16'.

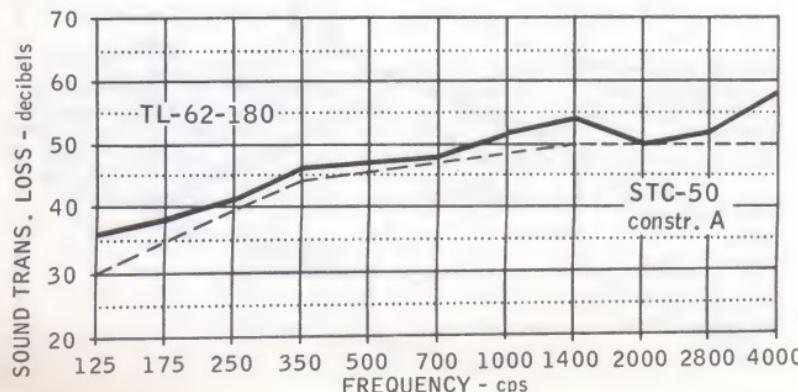
FIRE AND SOUND RATED CONSTRUCTION

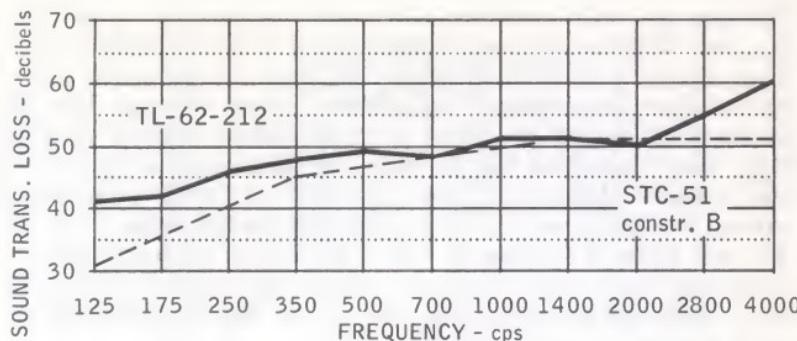
Construction (A): USG DWS-358 Metal Studs 24" o.c. in runners; one side, laminated or screw-attached double-layer $\frac{5}{8}$ " SHEETROCK Wallboard; opposite side, RC-1 channels horizontally applied 24" o.c. between base and face layers of $\frac{5}{8}$ " SHEETROCK Wallboard; face layer screw-attached to RC-1 channel; joints finished. **Construction (B):** Same as (A) with 3" THERMAFIBER Insulating Blankets inserted in stud cavity.

ADVANTAGES

Fire Resistance—2 hours estimated.

Sound Control—51 STC with Construction (B); 50 STC with (A).





MATERIALS

1. **Resilient Channels**—RC-1 SHEETROCK Resilient Channel.
2. **USG Metal Studs**—DWS-358 (3½").
3. **USG Runners**—DWR-358 (3½").
4. **Faceboards**—5/8" thick, 48" wide Tapered Edge SHEETROCK (Regular) (FIRECODE)—lengths as required.
5. **Backing Board**—5/8" thick, 24" wide BAXBORD (Regular) (FIRECODE)—8' lengths.
6. **Laminating Adhesive**—PERF-A-TAPE Joint Compound (embedding type) or USG Laminating Adhesive.
7. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.
8. **Fasteners**—USG Drywall Screws, 1" Type S, 1½" Type S, ¾" Type S-12 pan head, 1½" Type G.
9. **USG Metal Trim** (No. 200-A) (No. 401) (No. 402).
10. **USG Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.
11. **Insulation**—THERMAFIBER Insulating Blankets, 3"x23"x96".

INSTALLATION

Stud System Erection—Using metal studs and runners, install partition framing as described on page 144.

Panel Erection—Apply the base layer vertically with vertical joints staggered on both sides of the partition and screw-attach with 1" USG Drywall Screws Type S spaced 16" o.c. in field and along vertical joints of board.

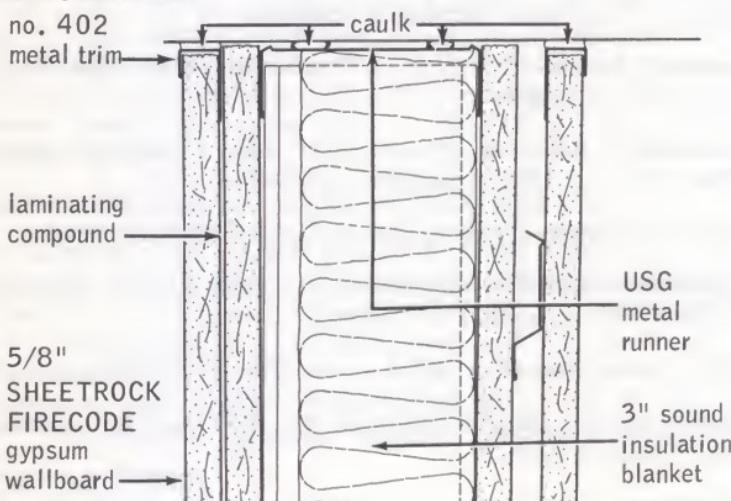
On side opposite the RC-1 Resilient Channel apply face layer vertically with vertical joints offset 24" from base layer joints and staggered on opposite sides of the partition. Attach with 1½" USG Drywall Screws Type S spaced 16" o.c. in field and vertical joints of the board, or laminate and hold in place with 1½" USG Drywall Screws Type G. Use sheet or strip lamination method (see page 70).

Position the RC-1 Resilient Channels horizontally, space 24" o.c. and attach to the metal studs with 1" USG Drywall Screws Type S driven through the single $\frac{5}{8}$ " base layer. Locate channels at floor and within 6" of ceiling. Extend channels into all corners and fasten to corner framing. Splice channel directly over studs by nesting the channels and fastening both flanges to the support. Apply face layer parallel to resilient channels. Attach wallboard with 1" USG Drywall Screws Type S spaced 12" o.c. along the channels. Center horizontal abutting edges of wallboard over screw flange of channel and screw-fasten each edge. Back-block all vertical butt joints with a minimum 8" wide strip of $\frac{3}{8}$ " gypsum board.

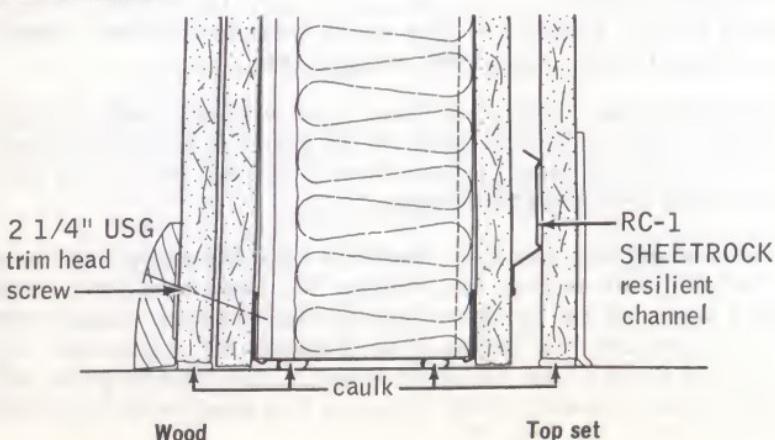
Insulating Wool—Install 3" THERMAFIBER Insulating Wool Blanket as directed in Chapter 3, page 112.

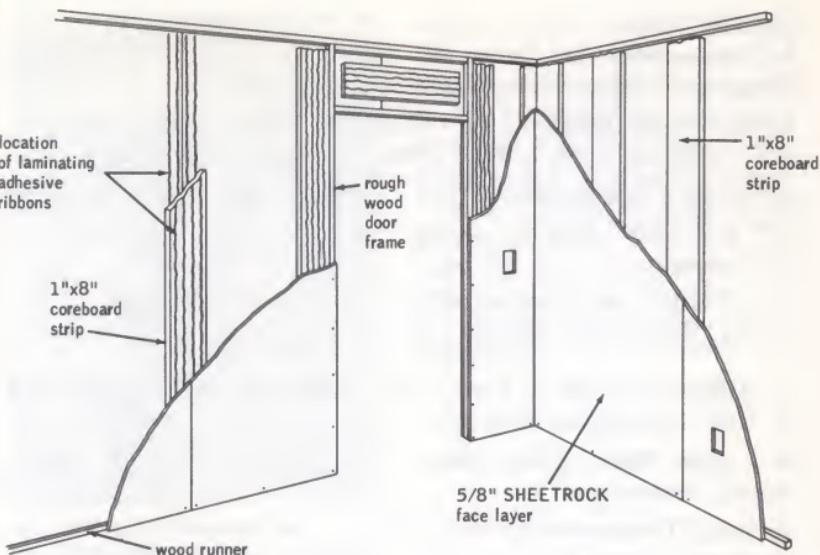
Finishing Partition—Apply metal trim and corner bead, caulk perimeter, and treat all joints, fastener heads and trim as directed in Chapter 3.

Ceiling attachment



Floor attachment





USG Laminated Gypsum Partitions Semi-Solid Partition

The USG Semi-Solid Partition is a low-cost, functional and structurally sturdy assembly for divider walls in residential construction. Particularly suited for use with trussed roofs, this non-load bearing partition can be erected without conventional wood stud framing. Limiting height: 10'.

Construction: $\frac{5}{8}$ " SHEETROCK Wallboard face layers erected vertically and job laminated to 1"x8" USG Coreboard Strips 24" o.c.; face layers screw attached to full size 1"x1" wood floor and ceiling runners; joints finished.

ADVANTAGES

Incombustible, except for wood runners.

Finer Finishing—effectively back-blocked vertical joints; a minimum of face layer fasteners.

Economical—simplified components and elimination of wood studs, speeds up construction.

MATERIALS

1. **Faceboards**— $\frac{5}{8}$ " thick, 48" wide Tapered Edge SHEETROCK (Regular) (FIRECODE)—lengths as required.
2. **Coreboard Strips**—1"x8" USG Coreboard Strips, snapped and separated from 1"x24" USG Coreboard prescored 8" o.c.
3. **Wood Components**—1"x1" minimum size stock, straight, true and free of knots.
4. **Fasteners**
 - USG Drywall Screws—1 $\frac{1}{4}$ " Type W, 1 $\frac{1}{2}$ " Type G.
 - Nails—1 $\frac{1}{4}$ " GWB Annular Ring Nail.
5. **Adhesive**—PERF-A-TAPE Joint Compound (embedding type) or USG Laminating Adhesive.
6. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.
7. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.

INSTALLATION

Align wood floor and ceiling runners accurately according to the partition layout. Plumb runners and securely fasten with nails or other suitable anchorage spaced 16" o.c. Ceiling runners may be attached 24" o.c. where framing occurs at this spacing.

Install rough door frame of 1"x1" minimum wood stock before wallboard is applied (Fig. A). Toenail strut members securely to floor and ceiling runners. Set rough frame header between struts and nail in place.

Position floor-to-ceiling height face panels vertically on one side of floor and ceiling runners. Arrange panels so that vertical abutting joints are at least 8" from doors and other openings. Fasten face boards to other openings. Fasten face boards to runners with three 1 $\frac{1}{4}$ " Type W drywall screws or GWB-54 nails in each runner. At door frames and other openings, fasten face layers to rough framing with drywall screws spaced 12" o.c. or nails spaced 8" o.c.

Snap 1"x8" coreboard strips from prescored 24" wide board. Place board with a prescored line over the edge of a table or coreboard stack. Separate strip by forcing sharply downward (Fig. B). Cut coreboard strips to fit vertically between floor and ceiling runners and horizontally over door headers.



Fig. A



Fig. B



Fig. C

Apply USG Laminating Adhesive or PERFA-TAPE Joint Compound (embedding type) to the back side of first layer of face boards where coreboard strips will be laminated (Fig. C). Use the strip laminating method described on page 70. For convenience, adhesive may be applied to coreboard strips before they are erected.



Fig. D

Immediately after applying adhesive, laminate coreboard strips to back side of erected face boards (Fig. D). Place strips completely around door openings and at partition intersections, corners and terminals. At partition corners and "T" intersections where coreboard strips meet, nail them together at third points with 10d nails. This nailing is required in addition to lamination.

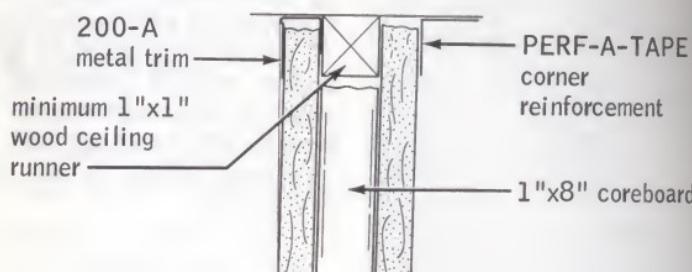


Fig. E

After all coreboard strips have been placed, apply adhesive to strips as previously described. Position second face layer vertically with long edge centered over coreboard strip (Fig. E). Fasten face layer to runners and rough door framing as previously described.

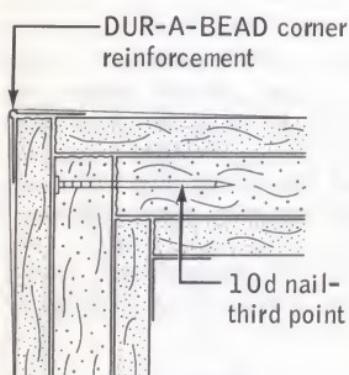
Apply metal trim and corner bead to finish partition. Treat all joints, fastener heads and trim as shown in Chapter 3.

Semi-solid partition details

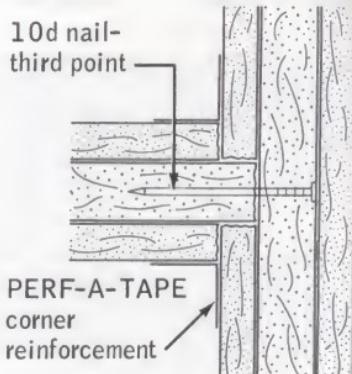


Floor and ceiling attachments

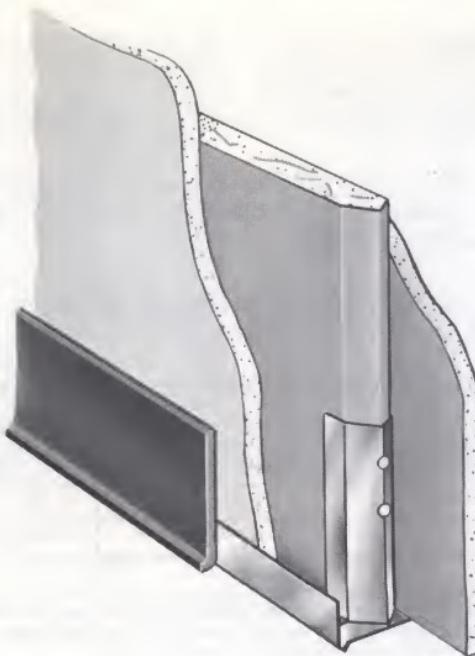
Intersecting walls



Partition corner



Partition "T"



2" Solid Partition

2" Solid Partitions are by far the most economical, both in erected cost and floor space occupied, of the 2-hour fire-rated gypsum drywall assemblies. These non-load bearing constructions are ideal for interior partitions or vent shaft enclosures. In these partitions SHEETROCK Wallboard face layers are job-laminated to both sides of 1" USG Gypsum Coreboard secured by floor and ceiling runners. The coreboard is cut or routed to receive electrical services.

FIRE AND SOUND RATED CONSTRUCTION

Construction (A): $\frac{1}{2}$ " SHEETROCK FIRECODE face layers applied vertically with staggered joints and laminated to 1" USG Coreboard in metal floor and ceiling runners; joints treated.

Construction (B): Same as (A) except untreated wood floor and ceiling runners, $\frac{1}{2}$ " regular SHEETROCK Wallboard face layers. **Construction (C):** Vent shaft construction: $\frac{5}{8}$ " SHEETROCK FIRECODE face layers vertically applied each side over 1" USG Coreboard; face layers laminated and screw attached; $1\frac{3}{8}'' \times \frac{7}{8}'' \times 22$ ga. metal angle runners placed horizontally at floor and quarter panel heights; DWR-158 Runner at ceiling; joints staggered and unfinished.

ADVANTAGES

Fire Resistance—2 hours with Construction (A), 1½ hours with (B). Construction (C) is 2-hour drywall vent shaft design.

Versatility—Space-saving divider between units; highly effective as vent shaft enclosure; suitable for use in all type of new construction and remodeling.

Economical—Low-cost materials and a minimum number of parts erect fast for superior economy.

Maximum Recommended Partition Heights (1)

Width Between Restraints	2" Solid Partition	2¼" Solid Partition (2)
Up to 12'	12'	14'
12' to 18'	11'	13'
Over 18'	10'	12'

(1) For partitions with complete perimeter restraint and no openings. Where openings occur in short runs, use maximum height "over 18 ft." width between restraints.

(2) When $\frac{3}{8}$ " thick SHEETROCK wallboard used as face layers.

MATERIALS

1. Faceboards— $\frac{1}{2}$ " or $\frac{5}{8}$ " thick, 48" wide, Tapered Edge SHEETROCK Wallboard (regular) (FIRECODE)—lengths as required.

2. Coreboard—1" thick, 24" wide, USG "V" T & G Edge Gypsum Coreboard, lengths as required.

3. Runners

—Metal—USG DWR-218 Runner or USG DWR-158 Runner or $1\frac{3}{8}'' \times \frac{7}{8}'' \times 22$ ga. metal angle runner (for Construction C).

—Wood—1"x1" minimum size stock, straight, true and free from knots.

4. Fasteners—USG Drywall Screws—1", 1¼", 2¼" Type S, 1½" Type W, 1½" Type G.

5. USG Core Spacer Clip.

6. Adhesive—PERF-A-TAPE Joint Compound (embedding type) or USG Laminating Adhesive.

7. Corner Bead—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.

8. Metal Trim—#401, #402, #200A, #200B USG Metal Trim.

9. Joint Treatment—PERF-A-TAPE or DURABOND Joint System.



Fig. A



Fig. B

INSTALLATION

Partition Construction

Align DWR-218 Runners accurately at the floor and ceiling according to the partition layout. Follow instruction for positioning, attaching, and caulking behind runners shown in Chapter 3.

Cut coreboard to fit between floor and ceiling runners. Before installation, cut necessary openings in coreboard to accept electrical services (i.e. rigid conduct, flexible cable, electrical boxes, etc.) Install coreboard vertically, exposing rounded tongue edge. Insert a core spacer clip between flanges of both floor and ceiling runners. Nail clips to coreboard through one of two holes in each clip (Fig. A). Repeat core spacer clip installation for each coreboard.

Place a cut-to-size section of coreboard over metal door frame header, engage bottom edge in anchor clips in door frame and secure top edge in runner with core spacer clip. Measure and cut next coreboard to fit snugly to metal door frame (Fig. B). Insert panels firmly into anchor clips (see insert). After coreboard is installed, spot grout door frame at each anchor clip, using PERFA-TAPE Joint Compound.



Fig. C



Fig. D

Nail coreboard panels together where partitions intersect (Fig. C). Mark centerline of intersecting joint on face of coreboard which conceals joint. Drive 10d common nails 24" o.c. into coreboard along center line, $\frac{1}{2}$ " from corner edge. Nail partition corners in same manner.

Cut $\frac{1}{2}$ " face layer panels to fit completely inside floor and ceiling runners. Apply **PERF-A-TAPE** Joint Compound (embedding type) or **USG** Laminating Adhesive to coreboard or back of face layer panels. Apply face layer vertically to coreboard, with vertical abutting joints at least 3" away from coreboard joints. Seat bottom edge of face layer board into floor runner, and bow board slightly so top edge will slip into ceiling runner (Fig. D). Press face layer against coreboard to insure an adequate bond. Secure with $1\frac{1}{2}$ " Type G drywall screws as described in Chapter 3.

To finish partition apply metal trim and corner bead, caulk around all openings and partition intersections, treat all joints, fastener heads and trim as directed in Chapter 3.

Vent Shaft Construction

Align floor, ceiling and sidewall angle runners accurately according to the partition layout. Fasten runners securely to structural supports with suitable fasteners 24" o.c. Install DWR-158 ceiling runners by fastening through the web. Install $1\frac{1}{8}'' \times \frac{7}{8}'' \times 22$ ga. galvanized metal angle runners on the floor and sidewalls by fastening through the short leg. As an alternate, metal angles may be used as ceiling runners. Install side angle runners 30" long centered for attachment of horizontal bracing angles.

Install $1\frac{1}{8}'' \times \frac{7}{8}'' \times 22$ ga. galvanized bracing angles horizontally at quarter points down from the ceiling, up from the floor and spaced no greater than 5' o.c. Position long leg for wallboard attachment and fasten to sidewall angles with 1" Type S drywall screws.

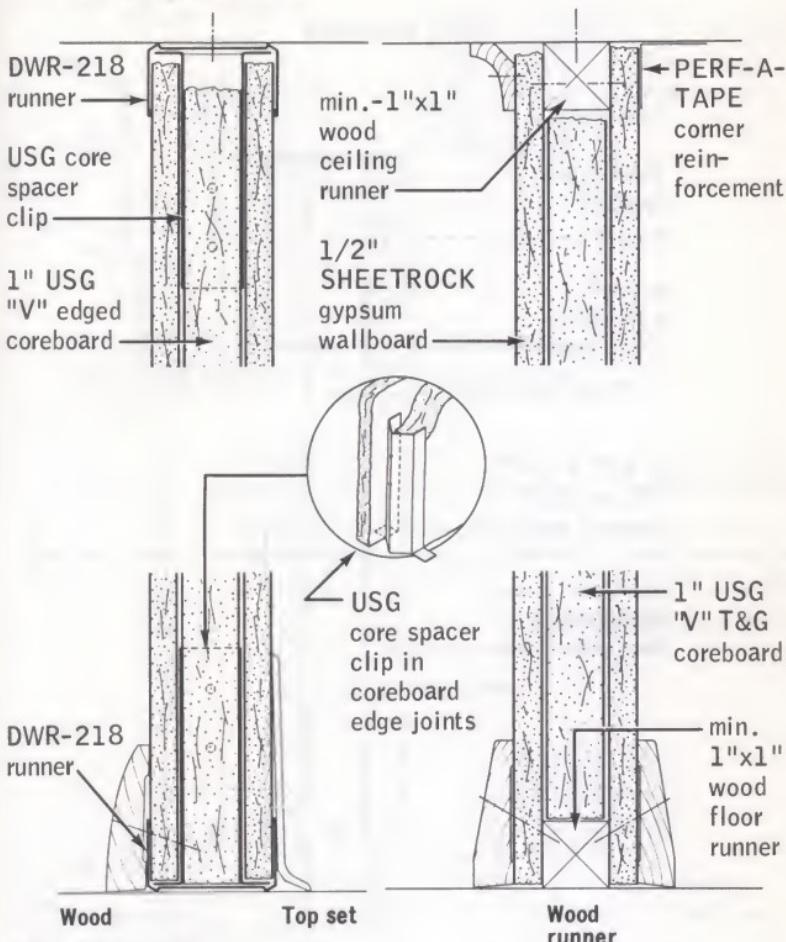
Apply $\frac{5}{8}$ " **SHEETROCK FIRECODE** Wallboard vertically and fasten to angles and runners with 1" Type S screws 16" o.c. Install 1" coreboard with vertical joints staggered 12" from wallboard joints using the sheet lamination method (see Chapter 3).

Install second floor and side angle runners (and ceiling angles, if required) with the long leg against the coreboard. Attach coreboard to ceiling runners and angles with $2\frac{1}{4}$ " Type S screws spaced 12" o.c. Drive screws at least 6" away from coreboard edges.

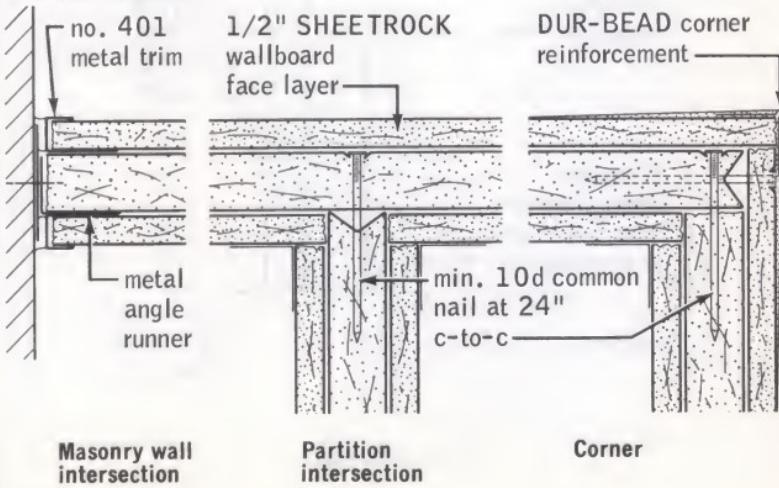
Install $\frac{5}{8}$ " **SHEETROCK FIRECODE** face layer vertically with vertical joints staggered 12" from joints in coreboard. Use the sheet lamination method and temporary nailing. Screw-attach face layer to angles around perimeter with 1" Type S screws 12" o.c. Fill nail holes with joint compound and finish joints if desired.

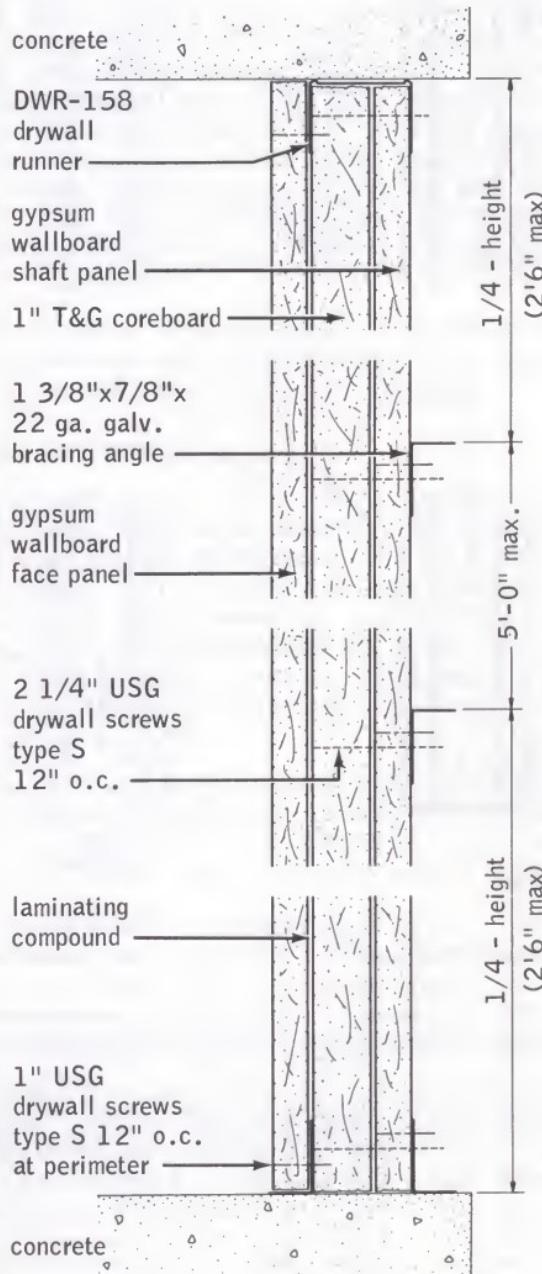
Solid partition details

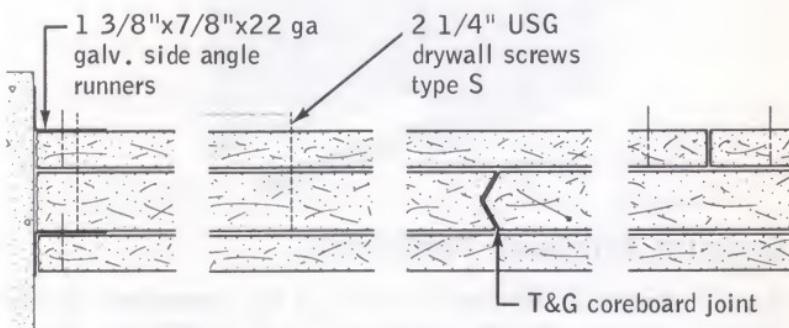
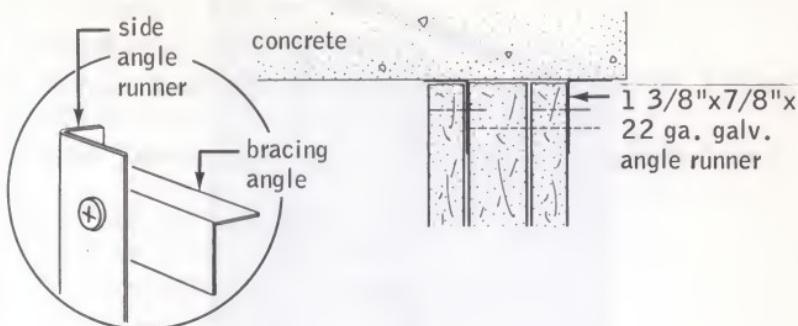
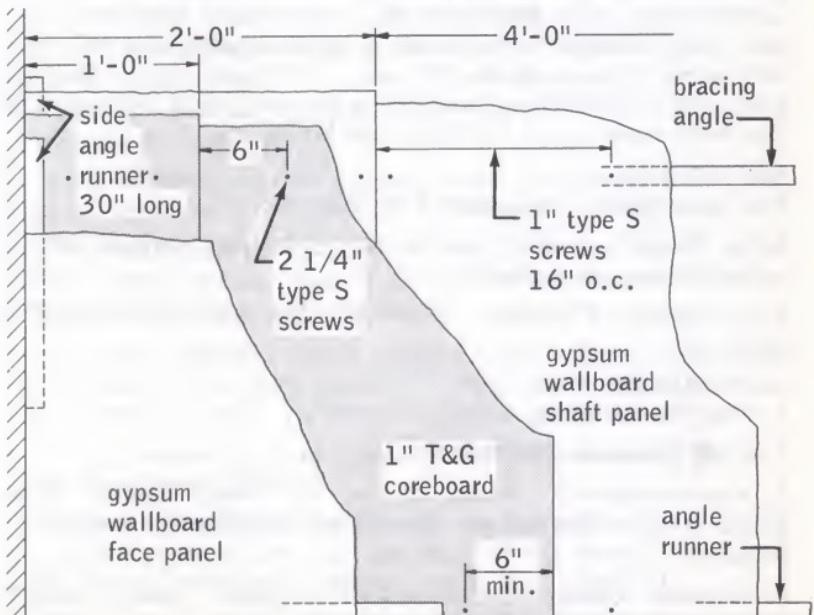
Floor and ceiling attachments

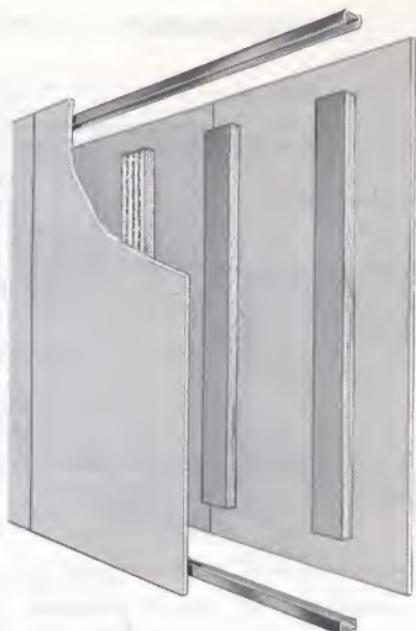


Wall plan sections



Vent shaft details**Ceiling attachment****Floor attachment**

Alt. ceiling attachment**Horizontal cross section****Wall elevation**



Gypsum Studwall Partitions

Gypsum Studwall Partitions are among the lowest-cost incombustible interior dividers available. These lightweight space-saving, non-load bearing assemblies have a built-in chase for electrical services. The systems inherently provide back-blocking; minimize joint ridging. Limiting height: 12'.

FIRE AND SOUND RATED CONSTRUCTION

Construction, 278 Studwall: $\frac{5}{8}$ " SHEETROCK FIRECODE face layers job-laminated to both sides of gypsum studs; $1\frac{5}{8}$ "x6" mill-fabricated gypsum studs 24" o.c., wallboard screw attached both sides of metal floor and ceiling runners; joints finished. **258 Studwall:** same except $\frac{1}{2}$ " thick face layers.

ADVANTAGES

Fire Resistance—1 hour with 278 Studwall.

Light Weight—6 to 7 psf. Ideal for interior dividers where reduced loads are required.

Space-Saving—Thickness: $2\frac{5}{8}$ " for 258 and $2\frac{1}{8}$ " for 278 Studwall.

MATERIALS

1. **USG Metal Studs**—DWS-158 ($1\frac{5}{8}$ ").
2. **USG Runners**—DWR-158 ($1\frac{5}{8}$ ").
3. **Faceboards**—48" Wide, $\frac{1}{2}$ " or $\frac{5}{8}$ " thick Tapered Edge (SHEETROCK) (SHEETROCK FIRECODE) Wallboard—lengths as required.
4. **Gypsum Studs**— $1\frac{5}{8}$ "x6" USG Gypsum Studs, factory laminated ($\frac{1}{2}$ " - $\frac{5}{8}$ " - $\frac{1}{2}$ ") in stock lengths.
5. **Adhesive**—USG Laminating Adhesive or PER-A-TAPE Joint Compound (embedding type).

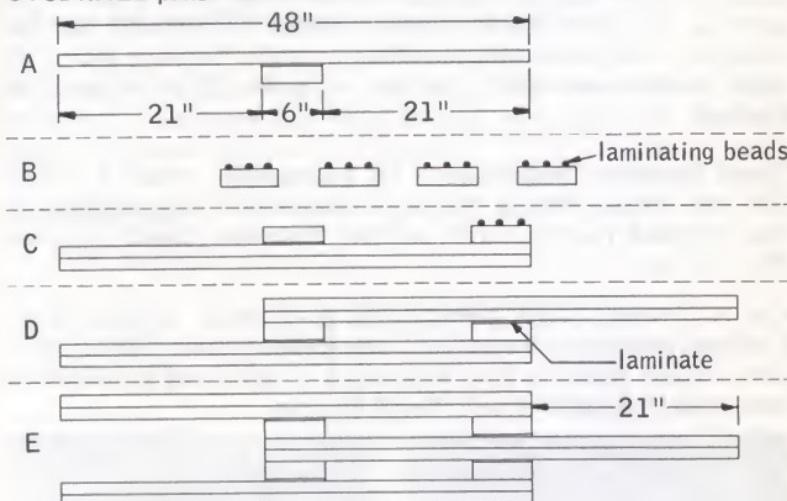
6. Fasteners—USG Drywall Screws, 1" Type S, $\frac{3}{8}$ " Type S-12, pan head, $1\frac{1}{2}$ " Type G.

7. Metal Trim—(choose type from page 32).

8. Corner Bead—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.

9. Joint Treatment—PERF-A-TAPE or DURABOND Joint System.

STUDWALL panel fabrication



INSTALLATION

Panel Fabrication—Laminate one $1\frac{5}{8}'' \times 6''$ Gypsum Stud in the center of back of face panel using USG Laminating Adhesive or PERF-A-TAPE Joint Compound (embedding type) (see Fig. A). Spread adhesive in heavy ribbons, approximately $\frac{1}{2}$ " wide at the base and $\frac{5}{8}$ " high. Space ribbons 2" o.c. and 1" away from each edge of gypsum studs. Use the following laminating procedure:

1. Place adhesive on four gypsum studs, $1\frac{5}{8}'' \times 6''$, cut 12" less than the length of the SHEETROCK face boards (see Fig. B).
2. Place an unopened bundle of SHEETROCK face boards on a smooth level surface. Boards should be cut to full floor-to-ceiling height for vertical application.
3. Place one adhesive coated gypsum stud, adhesive side down, in the center of the face board 21" from each side and 6" from top and bottom edges.
4. Place a second gypsum stud, adhesive side up, along the edge of the face board (Fig. C).
5. Stack a second unopened bundle of SHEETROCK face boards on top of gypsum studs so that edge of top bundle is aligned with edge of underlying center gypsum stud (Fig. D).
6. Repeat the laminating procedure and build the stack until the desired number of full panels are laminated (Fig. E).
7. Allow adhesive to set and dry before moving panels.

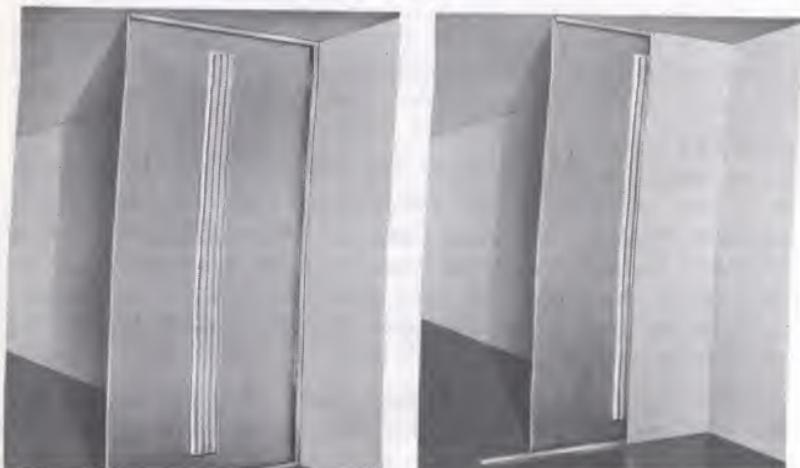
Stud and Runner Erection—Align DWR-158 Runners accurately at the floor and ceiling according to the partition layout. Attach floor runner securely 16" o.c. Follow instructions for positioning, attaching, and caulking behind runners shown in Chapter 3, page 110.

Install rough framing around door and borrowed light frames as described in Chapter 3, page 115.

Install floor to ceiling height DWS-158 USG Metal Studs vertically at "T" intersections, corners, partition terminals, and intersections with structural members or walls. Securely fasten all studs to floor and ceiling runners with the USG Metal Lock Fastener.

Panel Erection—Beginning at an intersection, attach a DWS-158 stud to an existing structural element on the centerline of the proposed partition with suitable fasteners spaced no more than 24" o.c.

Cut a 2' wide starter panel from a 4' width of face board (without gypsum stud attached) and install on one side of partition. Anchor panel to floor and ceiling runners and to DWS-158 stud with 1" Type S screws spaced 12" o.c.



Typical panel, erected

Starter & first full panel

Apply laminating adhesive to gypsum stud already attached to full size faceboard. Erect this panel on side opposite the starter panel so the starter panel edge bisects the gypsum stud. Fasten the panel to floor and ceiling runners and the DWS-158 stud with USG 1" Type S screws spaced 12" o.c.

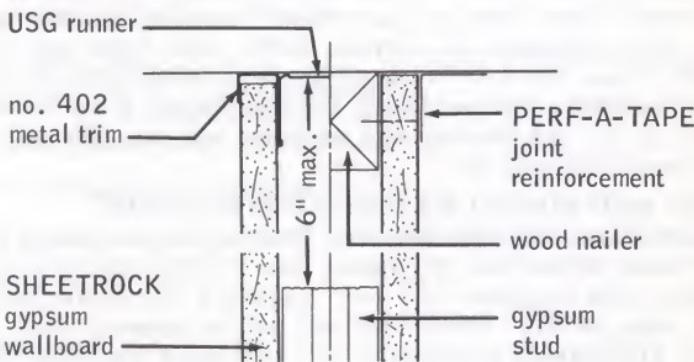
Continue erecting face panels with gypsum studs attached alternately to opposite sides of the partition. Fasten faceboards to runners and all metal studs with 1" Type S screws spaced 12" o.c. Screw faceboards to gypsum studs at vertical joints with 1½" Type G screws spaced 12" from runners and no more than 36" o.c. Keep vertical panel joints at least 6" away from

structural members, partition terminals, intersections, corners, doors and other openings. Gypsum studs in completed assembly should be spaced no more than 24" o.c.

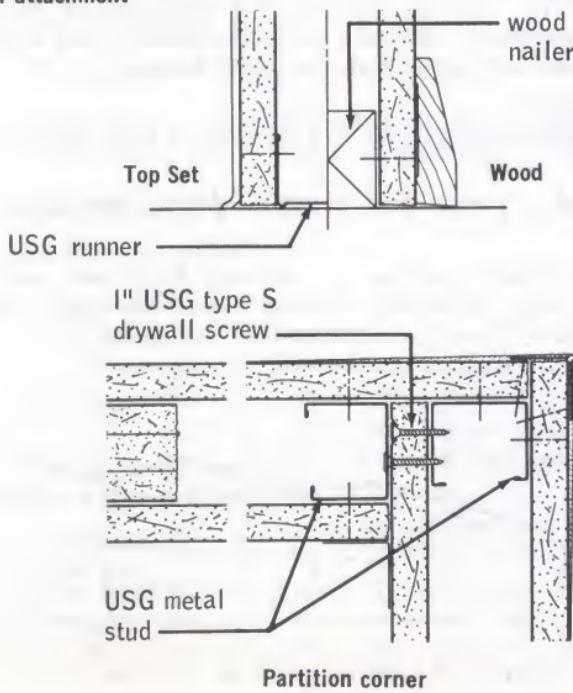
At partition corners complete the panel erection for one partition run. Then begin erection of intersecting partition as described above, attaching DWS-158 stud to previously erected partition with 1" Type S screws spaced 24" o.c. Drive screws through face boards to engage corner metal stud in first partition run (see partition corner detail, page 169).

Finishing Partition—Apply metal trim and corner bead, caulk perimeter if necessary for sound control, treat all joints, fastener heads and trim as directed in Chapter 3.

Ceiling attachment



Floor attachment



Partition corner



368



418

Gypsum Ribwall Partitions

Gypsum Ribwall Partitions incorporate 1 $\frac{5}{8}$ " to 2 $\frac{1}{2}$ " of interior air space between opposite facings for improved fire and sound resistance. They accommodate electrical services and plumbing, and serve efficiently as narrow width party walls and vent shafts. These non-load bearing constructions inherently provide back-blocking; minimize ridging. Limiting height: 8' for 368 Ribwall; 12' for 418 Ribwall with restraints less than 20', and 10' with restraints over 20'.

FIRE AND SOUND RATED CONSTRUCTION

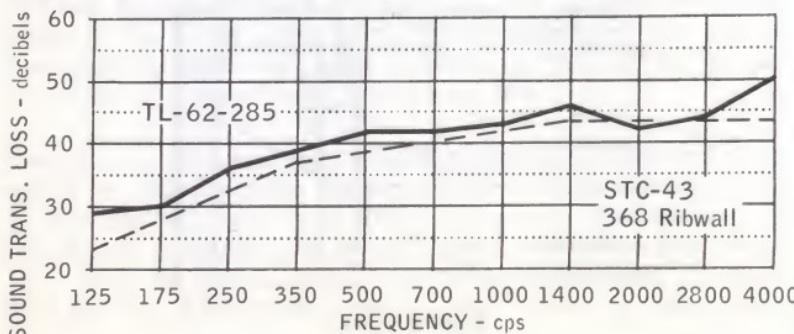
Construction, 368 Ribwall: $\frac{5}{8}$ " SHEETROCK face layers job-laminated to one side of gypsum ribs; 1 $\frac{5}{8}$ "x6" mill-fabricated gypsum ribs staggered 12" o.c.; wallboard screw attached to both sides of 2 $\frac{1}{2}$ " DWR floor and ceiling runners; joints finished. **418 Ribwall:** double-layer $\frac{5}{8}$ " SHEETROCK FIRECODE Wallboard job laminated to one side of gypsum ribs; 1"x6" gypsum ribs staggered 12" o.c. are snapped and separated on the job from USG Coreboard; wallboard screw attached to both sides of 1 $\frac{5}{8}$ " DWR floor and ceiling runners; joints finished.

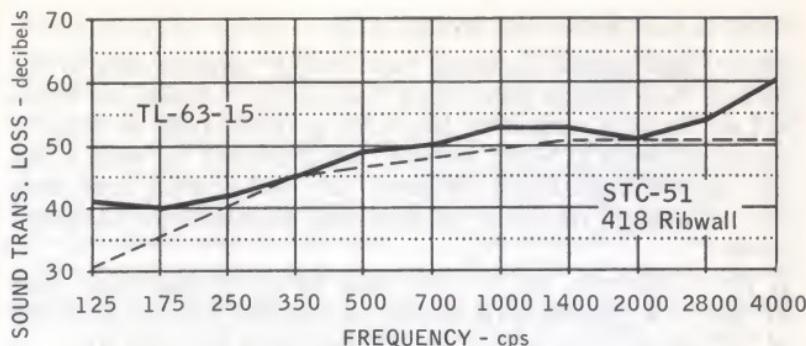
ADVANTAGES

Fire Resistance—2 hours with 418 Ribwall, 1 hour (est.) with 368 Ribwall.

Sound Control—51 STC with 418 Ribwall; 43 STC with 368 Ribwall.

Light Weight—Space savings and reduced loads are superior for sound ratings obtained. 368 Ribwall—thickness 3 $\frac{3}{4}$ ", weight 8 psf. 418 Ribwall—thickness 4 $\frac{1}{8}$ ", weight 12 psf.





MATERIALS

368 Ribwall

1. **Faceboards**— $\frac{5}{8}$ " thick, 4' wide Tapered Edge SHEETROCK Wallboard—lengths as required.
2. **Gypsum Ribs**— $1\frac{5}{8}$ "x6" USG Gypsum Ribs, factory laminated ($\frac{1}{2}$ "- $\frac{5}{8}$ "- $\frac{1}{2}$ ") in stock lengths.
3. **USG Metal Studs**—DWS-212 (2 $\frac{1}{2}$ ").
4. **USG Runners**—DWR-212 (2 $\frac{1}{2}$ ").
5. **Fasteners**—USG Drywall Screws, 1" Type S, $\frac{3}{8}$ " Type S-12 pan head, 1 $\frac{1}{2}$ " Type G.

418 Ribwall

1. **Faceboards**— $\frac{5}{8}$ " thick, 4' wide Tapered Edge SHEETROCK FIRECODE—lengths as required.
2. **Base Layer**— $\frac{5}{8}$ " thick, 4' wide BAXBORD, 8'.
3. **Gypsum Ribs**—1"x6" USG Gypsum Ribs, snapped and separated from 1"x24" USG Coreboard prescored 6" o.c.
4. **USG Metal Studs**—DWS-158 (1 $\frac{5}{8}$ ").
5. **USG Runners**—DWR-158 (1 $\frac{5}{8}$ ").
6. **Fasteners**—USG Drywall Screws, 1" and 1 $\frac{5}{8}$ " Type S, $\frac{3}{8}$ " Type S-12 pan head, 1 $\frac{1}{2}$ " Type G.

Both Partitions

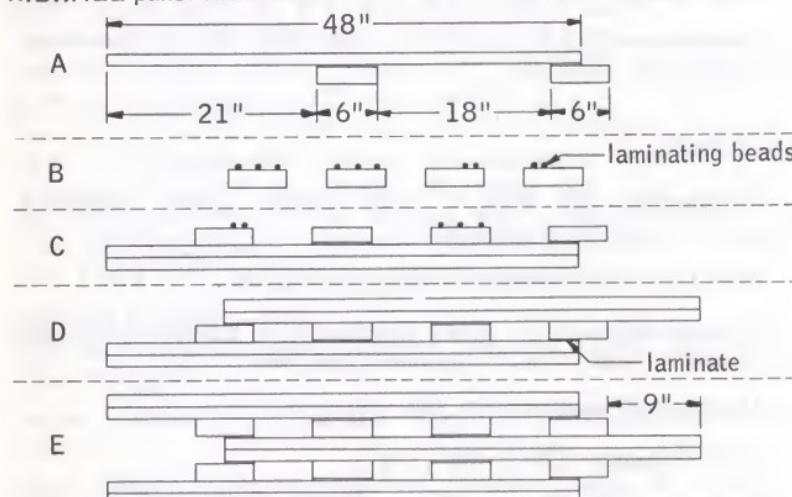
1. **Adhesive**—USG Laminating Adhesive or **PERF-A-TAPE** Joint Compound (embedding type).
2. **Metal Trim**—(choose type from page 32).
3. **Corner Bead**—DUR-A-BEAD, **PERF-A-BEAD**, ECONO Corner Reinforcement.
4. **Joint Treatment**—**PERF-A-TAPE** or DURABOND Joint System.

INSTALLATION—368 RIBWALL

Panel Fabrication—Laminate two $1\frac{5}{8}'' \times 6''$ gypsum ribs to the back of face boards using USG Laminating Adhesive or PERFA-TAPE Joint Compound (embedding type) (see A below). Spread adhesive in heavy ribbons, approximately $\frac{1}{2}$ " wide at the base and $\frac{5}{8}$ " high. Space ribbons 2" o.c. and 1" away from each edge of gypsum ribs. Use the following procedure per diagrams below.

1. Place four ribs, cut 12" less than length of face panel, side by side on a smooth, level surface and spread adhesive over two of the ribs and over half of the two remaining ribs (see B).
2. Place an unopened bundle of $\frac{5}{8}$ " SHEETROCK face boards on a smooth level surface. Boards should be cut to full floor-to-ceiling height for vertical application. Lay the four ribs in position (see C) with the rib ends 6" from the top and bottom of the face panels.
3. Place an unopened bundle of $\frac{5}{8}$ " SHEETROCK face boards on top of the four ribs in a staggered position (see D).
4. Repeat the laminating procedure and build the stack until the desired number of panels are laminated (see E).
5. Allow laminating compound to dry before moving panels.

RIBWALL panel fabrication



Stud and Runner Erection—Align DWR-212 runners accurately at the floor and ceiling according to the partition layout. Attach floor runners securely 16" o.c. Follow instructions for positioning, attaching, and caulking behind runners shown in Chapter 3, page 110.

Using DWS-212 studs and DWR-212 runners install rough framing around door and borrowed light frames as described in Chapter 3.

Install floor to ceiling height DWS-212 studs vertically at "T" intersections, corners, partition terminals, and intersections with structural members or walls. Securely fasten all studs to floor and ceiling runners with the USG Metal Lock Fastener.

Panel Erection—Beginning at an intersection, attach a DWS-212 Metal Stud to an existing structural element on the centerline of the partition with suitable fasteners spaced no more than 24" o.c. Caulk beneath runner, as necessary. Then erect one entire side of the partition in the following manner:

Butt the un-ribbed, vertical edge of a 4' wide rib laminated panel firmly against existing wall. Screw attach panel to floor and ceiling runners and to stud with 1" Type Screws 12" o.c.

Apply laminating adhesive to exposed portion of gypsum rib on starter panel. Butt the next panel in position and screw attach to floor and ceiling runners with 1" Type S screws 12" o.c.

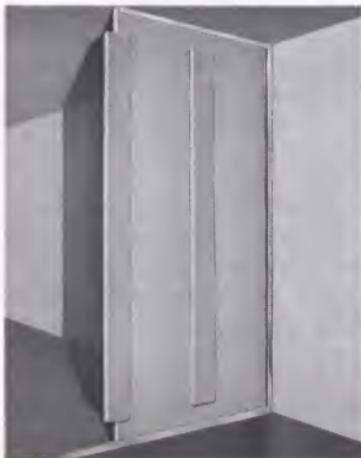
Before the adhesive sets, screw face panels to gypsum ribs at vertical joints with 1½" Type G screws spaced 12" from runners and no more than 36" o.c. Keep vertical panel joints at least 6" away from structural members, partition, terminals, intersections, corners, doors and other openings.

Fasten panels to all metal studs and runners with 1" Type S screws 12" o.c. Erect one entire side of partition as described above. Erect the second side of the partition in the same manner as the first side except begin with a 3' wide starter panel. The 3' starter panel is made by cutting 12" off a 4' panel on the edge opposite the rib.

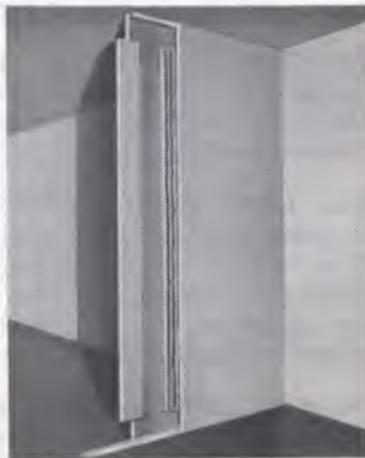
At door frames and other openings terminate the usual construction at one jamb and begin again at the other jamb. Position a cut-to-size wallboard panel over the door header and fasten ribwall and plain panels to all DWS studs and runners with 1" Type S screws 12" o.c.

At partition corners complete the panel erection for one partition run. Then begin erection of intersecting partition as described above, attaching a metal stud to previously erected partition with 1" Type S screws 24" o.c. Drive screws through face boards to engage corner metal stud in first partition run (see partition corner detail, page 169).

Finishing Partition—Apply metal trim and corner bead, caulk perimeter, treat all joints, fastener heads and trim as directed in Chapter 3.



Typical panel, erected



Starter & first full panel

INSTALLATION—418 RIBWALL

Panel Fabrication—Snap 1"x6" gypsum ribs from prescored 24" wide, 1" thick USG Coreboard. Place board with a pre-scored line over the edge of a table or coreboard stack. Separate strips by forcing sharply downward. Laminate two 1"x6" gypsum ribs to the back of BAXBORD panels using USG Laminating Adhesive or PERF-A-TAPE Joint Compound (embedding type). Spread adhesive in heavy ribbons approximately $\frac{1}{2}$ " wide at the base and $\frac{5}{8}$ " high. Space ribbons 2" o.c. and 1" away from each edge of gypsum ribs. Use the same procedure described for 368 Ribwall (see page 172).

Stud and Runner Erection—Align DWR-158 Runners accurately at the floor and ceiling according to the partition layout. Attach floor runners securely 16" o.c. Follow instructions for positioning, attaching, and caulking behind runners shown in Chapter 3, page 110.

Using DWS-158 studs and DWR-158 runners, install rough framing around door and borrowed light frames as described in Chapter 3, page 115.

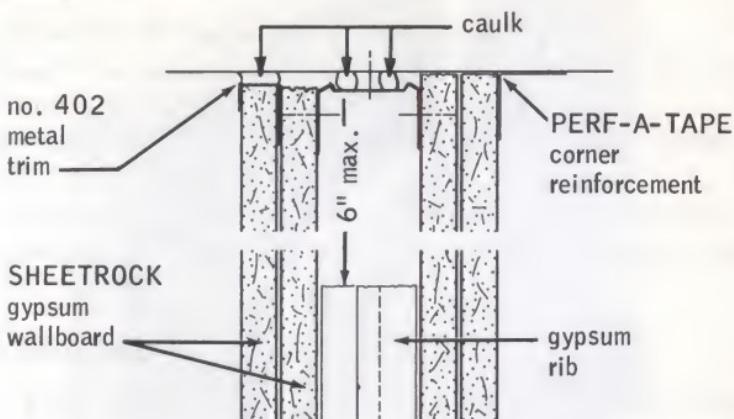
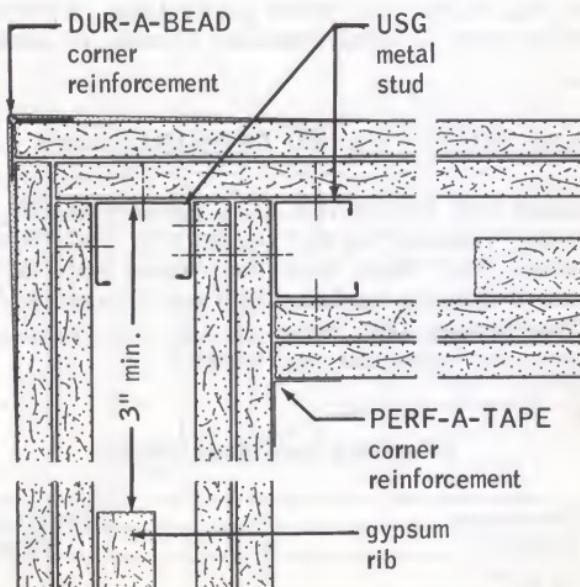
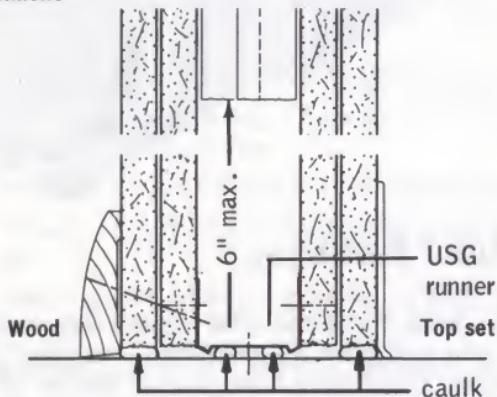
Install floor to ceiling height DWS-158 studs vertically at "T" intersections, corners, partition terminals, and intersections with structural members or walls. Securely fasten all studs to floor and ceiling runners with the USG Metal Lock Fastener.

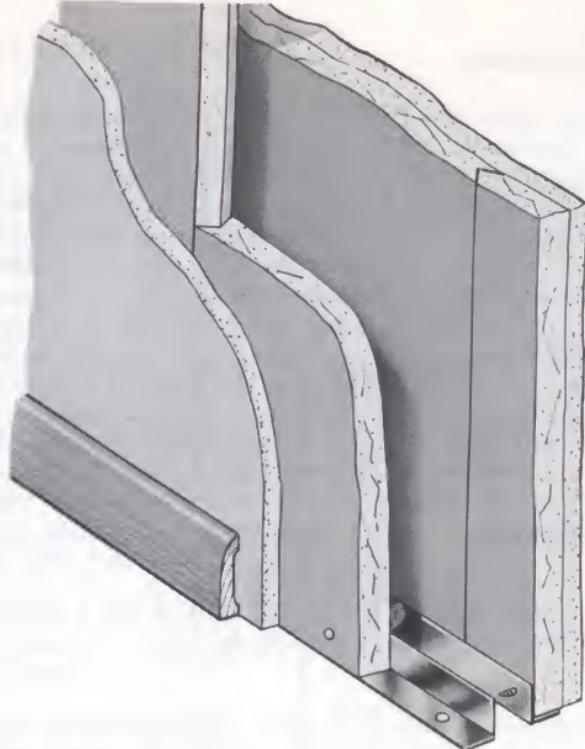
Panel Erection Base Layer—Beginning at an intersection, attach a DWS-158 Metal Stud to an existing structural element on the centerline of the partition with suitable fasteners spaced no more than 24" o.c. Caulk beneath runner, as required for sound control. Then erect the base layer to one entire side of the partition in the manner described above for 368 Ribwall. Fasten base layers to all metal studs and runners with 1" Type S screws 12" o.c. Screw base layers to gypsum ribs at vertical joints with $1\frac{1}{2}$ " Type G screws spaced 12" from runners and no more than 36" o.c. Keep vertical panel joints at least 6" away from all vertical metal studs.

Erect base layer to the second side of the partition in the same manner as the first side using the 3' wide starter panel described above for 368 Ribwall. Construction at door frames and partition corners is the same as for 368 Ribwall.

Face Layer—Apply the face layer panels vertically and in a staggered pattern so that vertical joints occur half way between those of the base layer. Laminate the face layer using the sheet lamination method described in Chapter 3. Permanently attach face panels to base layer and gypsum ribs with $1\frac{1}{2}$ " Type G screws as specified in Chapter 3.

Finishing Partition—Apply metal trim and corner bead, caulk perimeter, treat all joints, fastener heads and trim as directed in Chapter 3.

Ceiling attachment**Floor attachment****Partition corner**



Double Solid Partitions

USG Double Solid Partitions offer outstanding sound isolation at low cost plus a 2 hour fire-resistance—an ideal combination for party walls. The double construction feature of these non-load bearing partitions makes greater core widths available for plumbing and other mechanical installations. Widely used in combination with 2" Solid Partitions because of similar parts.

FIRE AND SOUND RATED CONSTRUCTION

Construction (A): Double row 1" Coreboard spaced 3" apart in metal angle runners; one row backed with 1½" THERMAFIBER Sound Attenuation Wool; both rows faced with ½" Regular SHEETROCK Wallboard laminated and screw attached; joints finished. **Construction (B):** Same as (A) but with coreboard rows spaced 1⅛" apart and wool omitted.

Allowable Maximum Height

Width Between Restraint	Max. Ceiling Height
Up to 10'	10'
10' to 14'	9'
Over 14'	8'

ADVANTAGES

2-Hour Fire Rating with construction (B).

Sound Control—60 STC (lab test) and 56 STC (job test) with Construction (A), 46 STC with (B).

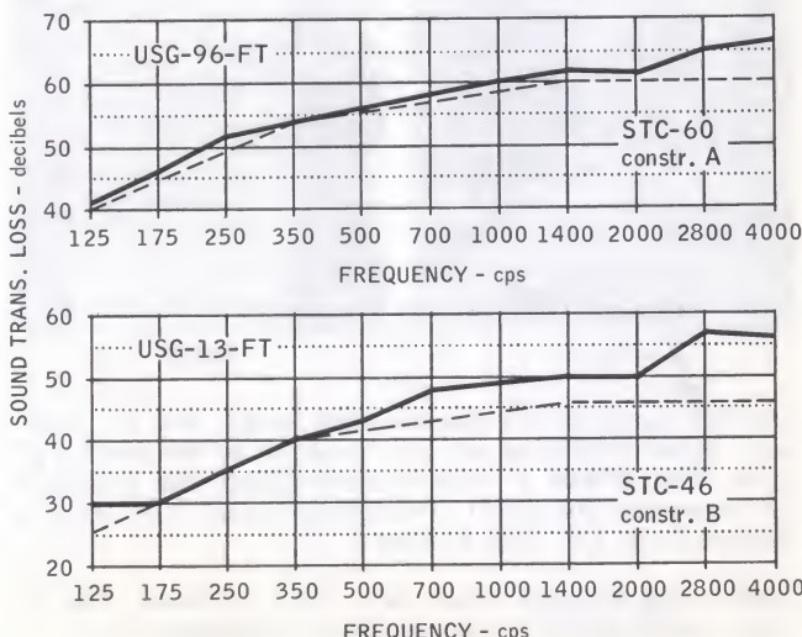
Versatility—Ideal for party walls and pipe chases; adapts to any module.

Weighs only 13 psf—less than comparable masonry partition.

Economy—Low cost compared with partitions of equal sound control efficiency.

MATERIALS

1. **Faceboards**— $\frac{1}{2}$ " thick, 48" wide Tapered Edge SHEETROCK Wallboard—lengths as required.
2. **Coreboard**—1" thick, 24" wide, USG "V" T&G Edge Gypsum Coreboard—lengths as required.
3. **Runners**— $1\frac{3}{8}$ " x $\frac{7}{8}$ " x 22 ga. Metal Angle Runners.
4. **Adhesive**—USG Laminating Adhesive or **PERF-A-TAPE** Joint Compound (embedding type).
5. **Fasteners**—USG Drywall Screws— $1\frac{1}{4}$ " Type S, $1\frac{1}{2}$ " Type G.
6. **Corner Bead**—DUR-A-BEAD, **PERF-A-BEAD**, ECONO Corner Reinforcement.
7. **Metal Trim**—#401, #402, #200A, #200B USG Metal Trim.
8. **Joint Treatment**—**PERF-A-TAPE** or **DURABOND** Joint System.
9. **Insulation**— $1\frac{1}{2}$ " x 24" x 48" **THERMAFIBER** Sound Attenuation Blankets.



INSTALLATION

Align metal angle runners accurately at the floor and ceiling according to the partition layout. Follow instructions for positioning, attaching, and caulking behind runners shown in Chapter 3, page 110.

Cut coreboard to fit accurately between runners. Install vertically with tongue edge leading. Attach coreboard to runners with $1\frac{1}{4}$ " Type S screws, 24" o.c. (Fig. A). Space screws at least 4" away from coreboard edge. Screws should hold coreboard snugly against runner flange without breaking paper.

Begin installing coreboard at door frame by engaging vertical edge in jamb anchor clips. Place cut-to-fit coreboard over metal frame header by engaging bottom edge in anchor clips and attaching to ceiling runners. Erect succeeding panels by screwing coreboard to vertical flanges of both floor and ceiling runners. Use PERFA-TAPE Joint Compound to spot grout around clips where coreboard panels are inserted in jamb anchor clips at door frames, borrowed light frames, and partition terminals.

At partition intersections and corners, nail coreboards together with 10d common nails spaced 24" o.c. (Fig. B). Mark center line of intersecting coreboard to center the nail.



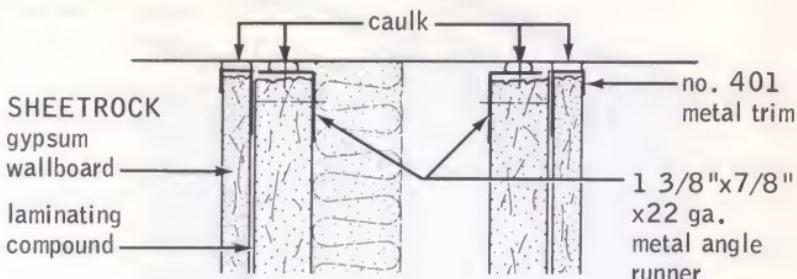
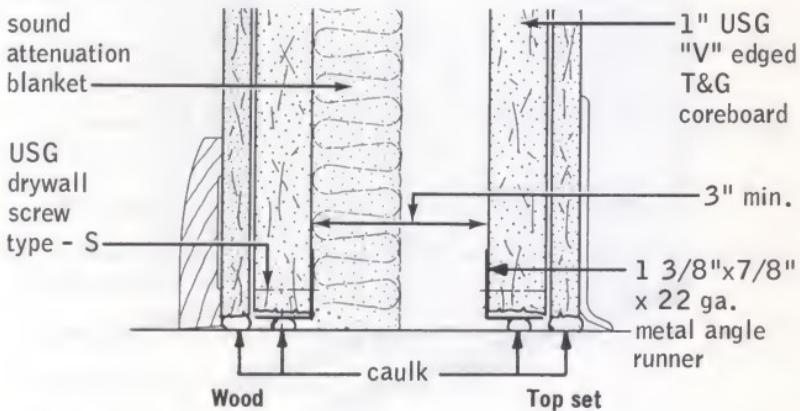
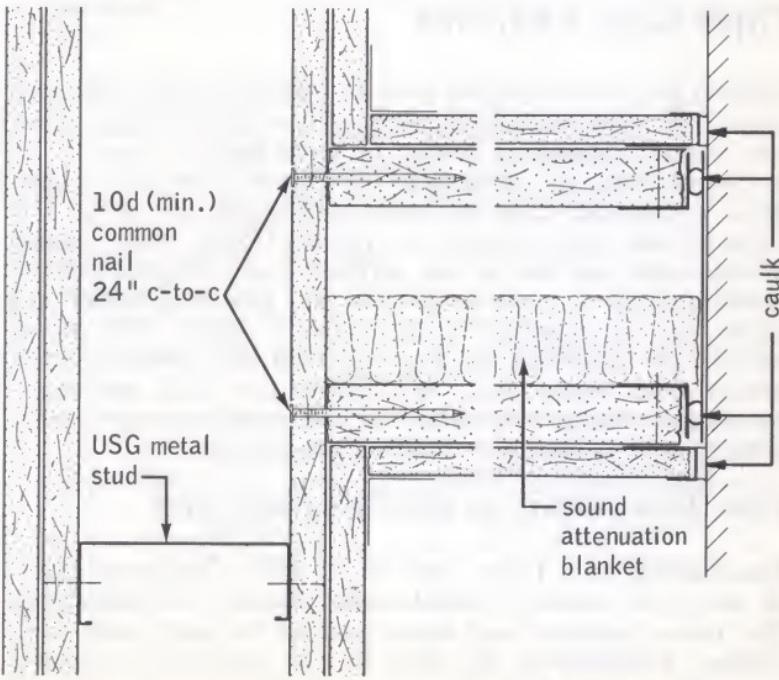
Fig. A

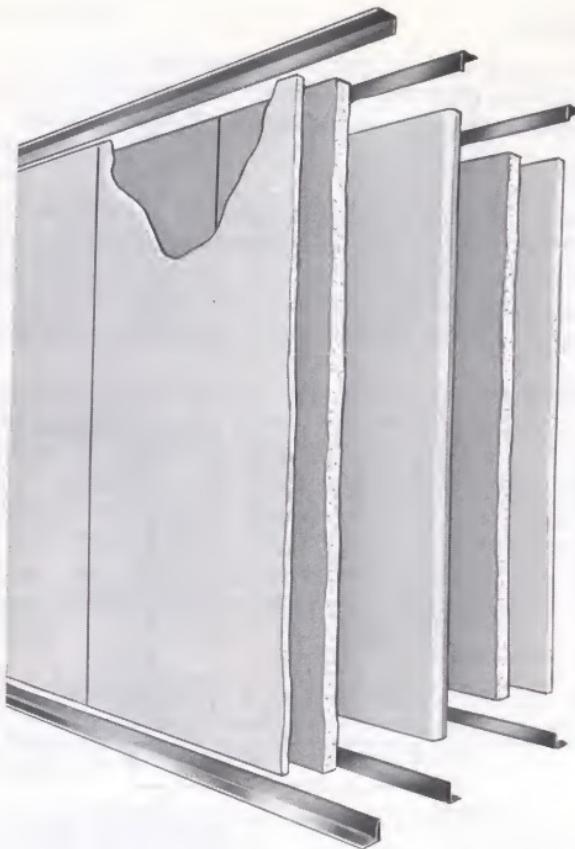


Fig. B

Cut face panels to full floor-to-ceiling height, less $\frac{1}{4}$ " clearance. Apply laminating adhesive, laminate to coreboard with joints offset at least 3" from coreboard joints (see Chapter 3 for laminating procedure). Permanently attach face layer to coreboard with $1\frac{1}{2}$ " Type G screws.

Apply metal trim and corner bead, caulk perimeter, treat all joints, fastener heads and trim as directed in Chapter 3.

Ceiling attachment**Floor attachment****Intersecting walls****Partition intersection****Masonry wall intersection**



Triple Solid Partitions

USG Triple Solid Partitions provide excellent on-the-job sound control for party wall construction. These incombustible, non-load bearing assemblies consist of three separate rows of 1" coreboard with $\frac{1}{2}$ " SHEETROCK Wallboard face layers laminated to the outer coreboard rows. The center row serves as a "septum" or uncut barrier to prevent sound from leaking through openings cut in the partition faces for electrical or plumbing fixtures, medicine cabinets, etc. Electrical conduit and boxes may be installed in the space on either side of the septum. By increasing the space between the coreboard rows, greater core widths may be obtained for light mechanical equipment without destroying the outstanding sound control properties of this assembly. Limiting height: 10'.

FIRE AND SOUND RATED CONSTRUCTION

Construction (A): Three rows of 1" USG Coreboard spaced at least $1\frac{1}{8}$ " apart in metal angle runners; $\frac{1}{2}$ " SHEETROCK face layers laminated and screw attached to outer rows; joints finished. **Construction (B):** Same as (A) but with air space of one side increased to accommodate $1\frac{1}{2}$ " THERMAFIBER Sound Attenuation Blankets stapled to back of one coreboard row.

ADVANTAGES

Sound Control—STC 59 with Construction (B); STC 53 with (A).

Fire Resistance—2 hours (est.); constructed of incombustible components.

Light Weight—17 psf—appreciably less than masonry partitions with equal sound efficiency.

Versatile—Outstanding for party walls and pipe chases; adapts to any module.

MATERIALS

1. Faceboards— $\frac{1}{2}$ " thick, 48" wide Tapered Edge SHEETROCK Wallboard—lengths as required.

2. Coreboard—1" thick, 24" wide, USG "V" T&G Edge Gypsum Coreboard—lengths as required.

3. Runners— $1\frac{3}{8}$ " x $\frac{7}{8}$ " x 22 ga. Metal Angle Runners.

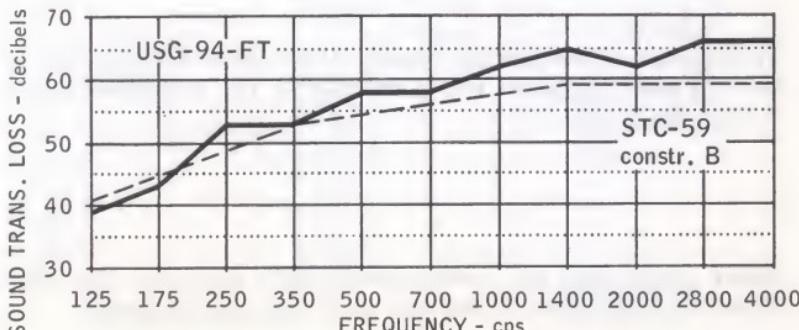
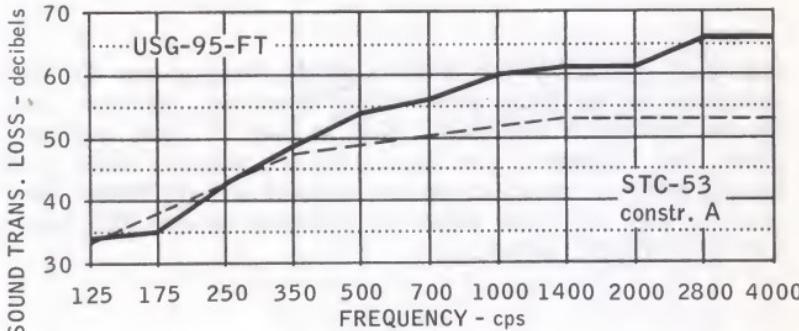
4. Adhesive—USG Laminating Adhesive or PERF-A-TAPE Joint Compound (embedding type).

5. Fasteners—USG Drywall Screws— $1\frac{1}{4}$ " Type S, $1\frac{1}{2}$ " Type G.

6. Metal Trim—#401 USG Metal Trim.

7. Joint Treatment—PERF-A-TAPE or DURABOND Joint System.

8. Insulation— $1\frac{1}{2}$ " x 24" x 48" THERMAFIBER Sound Attenuation Blanket.



INSTALLATION

Align metal angle runners accurately at the floor and ceiling according to the partition layout. Follow instructions for positioning, attaching and caulking behind runners shown in Chapter 3, page 110.

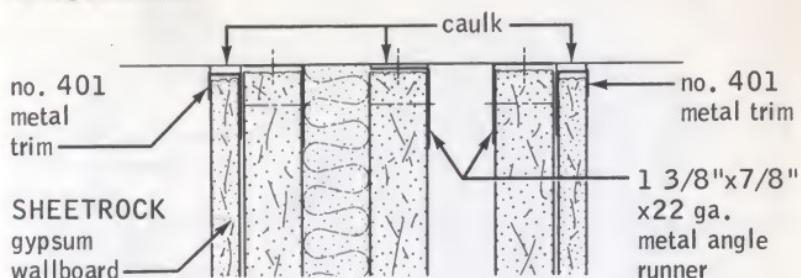
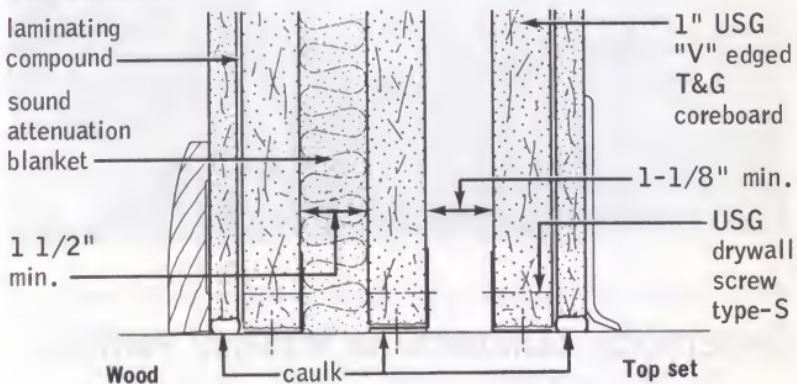
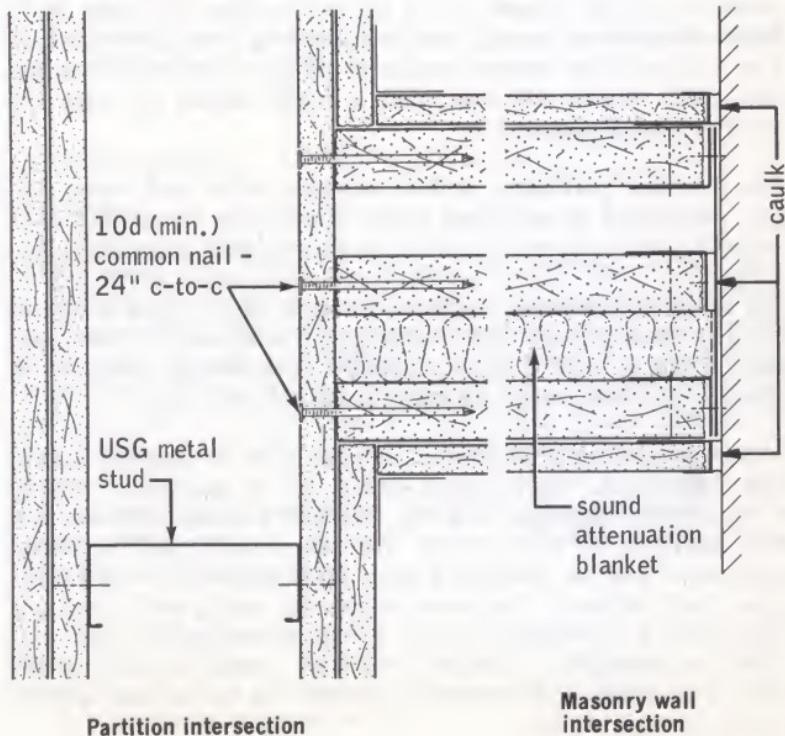
Cut coreboard to fit accurately between floor and ceiling runners and install vertically with tongue edge leading. Fasten coreboard to vertical flanges of both floor and ceiling runners with $1\frac{1}{4}$ " Type S screws 24" o.c. Space screws at least 4" away from coreboard edge. Screws should hold coreboard snugly against runner flange without breaking paper. Face tongue of coreboard in septum row in opposite direction from tongues in outer coreboard rows. Stagger joints in septum row from joints in outer coreboard rows.

At partition intersections and corners, nail coreboards together with 10d common nails spaced 24" o.c. Mark center line of intersecting coreboard to center the nail.

Cut face panels to full floor-to-ceiling height, less $\frac{1}{2}$ " for clearance and caulking space. Apply laminating adhesive, laminate to coreboard with joints offset at least 3" from coreboard joints (see Chapter 3 for laminating procedure). Install face boards with $\frac{1}{4}$ " space at top and bottom and at vertical intersections with terminal walls. Permanently attach face layers with $1\frac{1}{2}$ " Type G screws.

Install $1\frac{1}{2}$ " THERMAFIBER Sound Attenuation Blankets to the back of one coreboard row according to the procedure shown in Chapter 3, page 113.

Apply metal trim and corner bead, caulk perimeter and treat all joints, fastener heads and trim as directed in Chapter 3.

Ceiling attachment**Floor attachment****Intersecting walls**



SHEETROCK Laminated to Masonry Partition

SHEETROCK Gypsum Wallboard, adhesively applied directly to interior, above-grade, monolithic concrete or unit masonry, provides durable incombustible drywall surfaces to these walls. Where SHEETROCK facings are laminated to PYROBAR* Partition Tile, this non-load bearing assembly offers excellent fire protection, light weight, low cost, and is highly suited for vent and elevator shaft enclosures.

For PYROBAR partitions, surface is sealed with cold water wall size; wallboard is laminated using SHEETROCK Brand DWA-14 Adhesive and temporarily nailed or shored until adhesive is dry.

For interior monolithic concrete, concrete block, brick unglazed tile and other porous unit masonry, the wallboard is laminated using PERF-A-TAPE Joint Compound (embedding type) as an adhesive and face panel bracing until the adhesive dries.

Either regular or predecorated facings may be applied; except that SHEETROCK Vinyl Panels should not be laminated directly to monolithic concrete. Use the Drywall Furring Channel System described in this Chapter for this vinyl panel wallboard application and for wallboard application to exterior and below-grade wall surfaces. The inside of exterior cavity walls having a continuous (1" minimum) clear air space between exterior masonry and masonry or concrete, with *the outside surfaces of the interior masonry well dampproofed*, may be considered here, as an interior wall surface.

ADVANTAGES

Fire Resistance—Up to 3 hours (est) using 3" solid PYROBAR Tile.

Easily Decorated—Smooth durable surfaces are suitable for any type decorative treatment.

Versatile—Readily applied to existing or new masonry surfaces.

MATERIALS

1. **Gypsum Board**— $\frac{3}{8}$ ", $\frac{1}{2}$ " or $\frac{5}{8}$ " thick, 48" wide Tapered Edge SHEETROCK; $\frac{3}{8}$ " thick, 48" wide ULTRAWALL; $\frac{1}{2}$ " thick, 48" wide SHEETROCK Vinyl Panels—lengths as required.
2. **Adhesive**—PERF-A-TAPE Joint Compound (embedding type) or SHEETROCK Brand DWA-14 (for PYROBAR Tile).
3. **Metal Trim**—(choose type from Chapter 2).
4. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD or ECONO Reinforcement.
5. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.
6. **Sealer**—(For PYROBAR) Cold Water Wall Size as manufactured by Lepage's or equal.
7. **Partition Tile**—PYROBAR Partition Tile and Cement as specified in A.I.A. File No. 10-D.

INSTALLATION

Preparation

Mortar joints on surface of unit masonry to which wallboard is to be bonded should be cut flush with the masonry to provide an even surface. The wall surface should be plumb and true to dimensions. Rough or protruding areas must be ground off before laminating is started. Pockets or holes greater than 4" in diameter and $\frac{1}{8}$ " deep must be filled with grout, mortar, or joint compound and allowed to dry before laminating.

The masonry surface must have all form oils, grease and other release agents removed. It must be dry and free of dust, loose particles and efflorescence.

If a wood base is used, attach a wood nailer to the wall with mechanical fasteners before laminating wallboard. Nailer should be equal to the panel thickness and at least $1\frac{1}{2}$ " high (or $\frac{3}{4}$ " less than wood base height).

Panel Erection

Cut floor-to-ceiling height panels for vertical application. Allow for a continuous clearance ($\frac{1}{8}$ " to $\frac{1}{4}$ ") at the floor. Apply adhesive to the back of the wallboard in beads parallel to the long board dimension as described below:

PYROBAR Partition Tile: 4 beads of SHEETROCK Brand DWA-14 Adhesive $\frac{3}{8}$ " wide by $\frac{3}{8}$ " high, spaced about 16" o.c. and with the outside beads 1" from the edge.

Smooth monolithic concrete: beads of PERF-A-TAPE Joint Compound (embedding type) $\frac{5}{16}$ " wide by $\frac{3}{8}$ " high, spaced 3" to 4" o.c. and with the outside beads 2" from the edge.

Porous brick or concrete block masonry: beads of PERF-A-TAPE Joint Compound (embedding type) $\frac{3}{8}$ " wide by $\frac{1}{2}$ " high, space 5" to 6" o.c. and with outside beads 2" from edge.

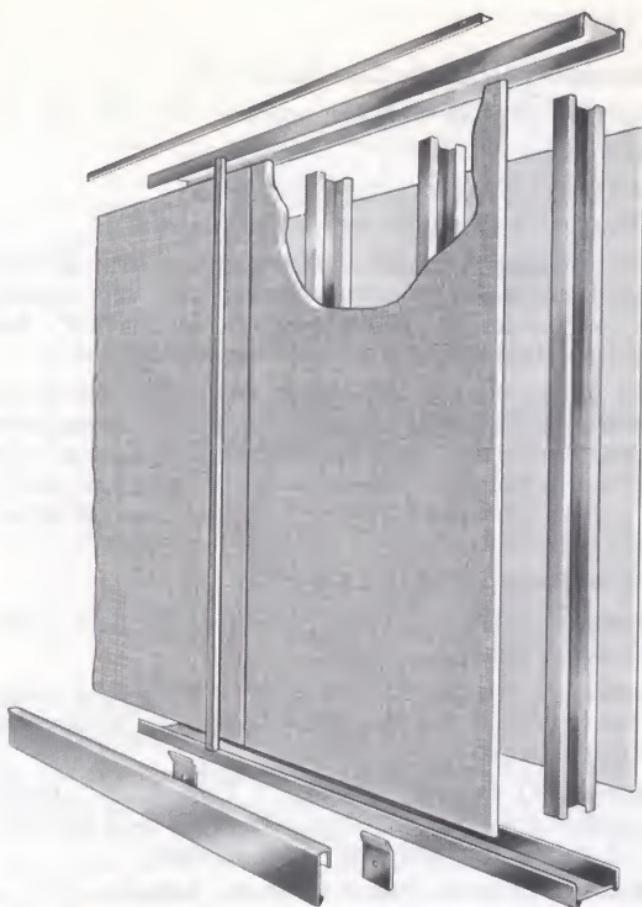
Position face panels vertically to provide a tight fit at abutting long edges. Use moderate pressure to develop full adhesive contact with concrete or masonry surface. Impact slightly with hand along DWA-14 Adhesive lines to insure adequate bond to PYROBAR Tile. Take care to avoid unnecessary impact on board after placement. If panel touches floor, cut it back to provide $\frac{1}{8}$ " min. clearance.

Provide temporary nailing or bracing of face panels until the adhesive dries (48 hours minimum). Use one of the following methods:

1. For PYROBAR Tile use temporary nails at third points along vertical joints. Drive nail at a 45° angle through scrap blocks of gypsum board.
2. For predecorated wallboard use SHEETROCK Moldings fastened securely into the masonry.
3. Center a floor-to-ceiling height wood 2x4 over vertical panel joints (and at middle of panel if required); angle brace 2x4 at mid-point to floor or ceiling.
4. Drive concrete stub nails at top and bottom of panel and wherever else required to complete wallboard bond to concrete or masonry. These nails are not required where metal trim is installed and anchored to the concrete.

Finishing

Install metal trim at all wall and ceiling intersections with other types of masonry. Apply metal trim and corner bead and treat all joints, temporary nail holes, fastener heads and trim as directed in Chapter 3. Apply reinforcing tape the full length of joint.



Movable Partitions

SHEETROCK Demountable Partitions

SHEETROCK Demountable Partitions offer complete flexibility in use and virtual 100% reusability. They have the highest sound rating of movable drywall partitions and yet are among the least expensive. Available in ceiling, cornice or bank rail heights, these incombustible partitions are non-load bearing, yet structurally sound and suitable for use in modernization or all types of new construction. The simplified, coordinated parts are readily available from dealer stocks; they erect quickly and require no special contractor training for assembly or relocation. Electric utilities are rapidly installed or changed.

FIRE AND SOUND RATED CONSTRUCTION

Construction (A): Regular SHEETROCK FIRECODE face layers applied vertically and laminated and screw attached to alternate 2½" USG Metal Studs (DWS-212) 24" o.c. in DWR runners; joints finished with anodized aluminum battens; matching aluminum trim accessories. **Construction (B):** Same as (A) with 2" THERMAFIBER Sound Attenuation Blankets in stud cavity.

ADVANTAGES

Fire Resistance—1 hour with Construction (B).

Sound Control—STC 49 with Construction (B); 42 with (A).

Lightweight—5 psf.

MAXIMUM ALLOWABLE DIMENSIONS

1. On ceiling height partitions, the limiting height is 12'.
2. On cornice height partitions, the limiting unrestrained length between supports, including cornice height with door openings joined by continuous top rail, should not exceed 14'0". Rails should not be spliced within 14'0" unrestrained lengths.
3. On bank rail partitions a continuous Rail A-06 must be used to cap the partition between restraints. Maximum recommended partition length: 14' with both ends terminating against a perpendicular wall, column or corner section; 8' with one end terminating against a perpendicular wall, column, corner section.

MATERIALS

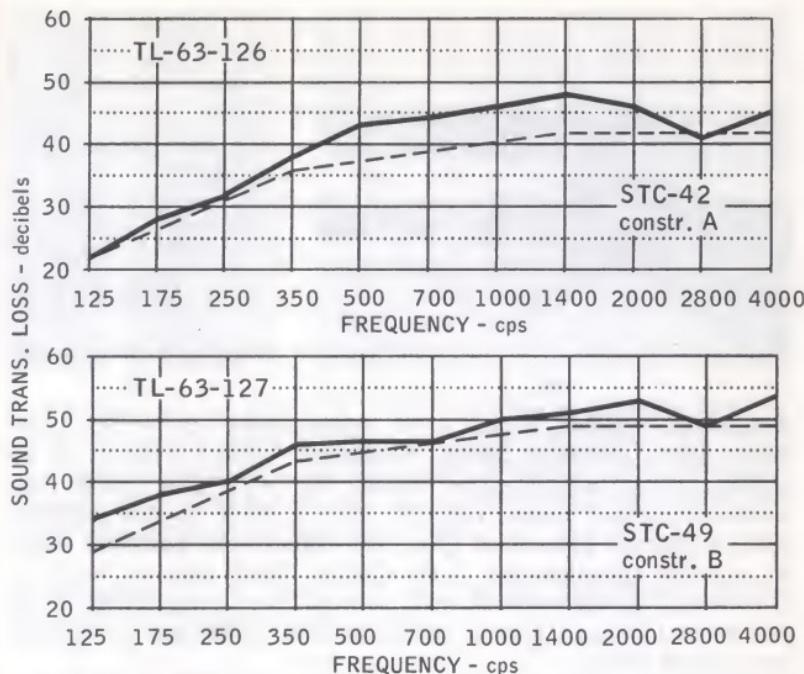
1. **USG Metal Studs**—DWS-212 (2½").
2. **USG Runner**—DWR-212 (2½"), 1¼" leg for floor runner, 1" leg for ceiling runner.
3. **Faceboards**—½" thick, 48" wide, SHEETROCK Wallboard—Square Edge regular, FIRECODE, Vinyl Panel, or Custom Vinyl types—lengths as required.
4. **Fasteners**—USG Drywall Screws, 1" Type S, ⅛" Type S cadmium plated, oval head, finishing; ⅜" Type S-12 pan head; 1¼" Type S, cadmium plated bugle head, finishing.
5. **Adhesives**—SHEETROCK Brand DWA-14 Adhesive (for use around one-piece steel door frames only); commercially available water based contact bond drywall adhesive (for laminating panels to studs.)
6. **Plastic Accessories Adhesive**—Sears Vinyl Household Adhesive, General Electric Silicone Rubber Adhesive, RTV-102 or equal.
7. **Steel Accessories**—

Post Plate	S-71	Rail Clip	S-70
Post Assembly	S-36	Floor Clip	S-11

8. **Aluminum Accessories (Anodized)**—

2½" Base	A-01	Picture Mold	A-45
4" Base	A-37	Glazing Rail	A-56
Ceiling Trim	A-02	Glazing Rail Cover	A-68
Drive-In Ceiling Trim	A-46	Plain Rail Cover	A-70
Exterior Corner	A-03	Post	A-73
Interior Corner	A-38	Post Channel	A-73A
Batten	A-04	Door Stop	A-72
Rail	A-06	Pedestal	A-74

9. **Vinyl (Plastic) Accessories**—Batten Insert P-05 (gray), P-06 (black); Post Cap P-69 (gray); P-70 (black); 2½" Base Closure Cap P-75; 4" Base Closure Cap P-76; Glazing Spline P-10.



INSTALLATION

Ceiling Height Partition

Stud System Erection—Align DWR-212 USG Metal Runners accurately at floor and ceiling according to partition layout. Ceiling runner fasteners must be centered in runner web if Ceiling Trim A-46 is used. Ends of ceiling runners attached to ceiling grid systems must abut on grids and be fastened with $\frac{3}{8}$ " Type S-12 pan head screws. Follow instructions in Chapter 3 for positioning, attaching and caulking behind runners.

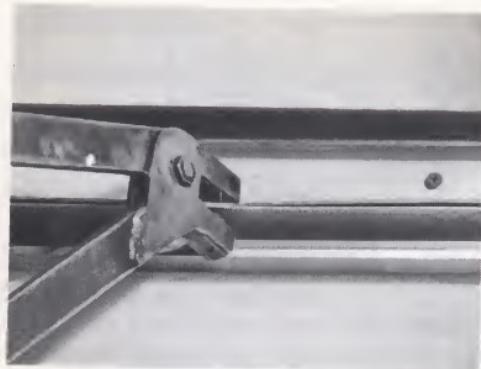
Install rough framing for door and borrowed light frames as described in Chapter 3.

Insert floor-to-ceiling height DWS-212 USG Metal Studs between runners, twisting them into position. Space studs 24" o.c.

At partition corners, install a stud so that it forms the outside corner. Following application of base layer wallboard to this stud, install second stud in the abutting run and screw-attach web through the base layer to flange of the first stud (see detail, page 197).

Place studs in direct contact with all abutting partitions, partition corners and other construction. At partition terminals, web of stud should be at terminal end with flanges directed into the partition.

Anchor to the floor and ceiling runners all studs located adjacent to door and borrowed light frames, partition intersections and corners. Use the USG Metal Lock Fastener or positive screw attachment through each stud flange and runner flange with $\frac{3}{8}$ " Type S-12 pan head drywall screw. When necessary, studs may be securely spliced with a minimum 8" nested lap (see page 145 for details).



A



B

Aluminum Ceiling Trim A-02 Application—With the USG Metal Lock Fastener, attach Aluminum Ceiling Trim A-02 to ceiling runner with crimps spaced 24" o.c. The metal tabs should be folded away from the trim so they do not interfere with wallboard placement (Fig. A). Where the partition abuts an existing structure the A-02 Ceiling Trim may be used by attaching it to the vertical stud prior to panel installation. A-46 Drive-On Ceiling Trim is installed after wallboard is applied (see details below).

Wallboard Erection—When Aluminum Battens A-04 are spaced 48" o.c., apply a water-based contact bond drywall adhesive continuously on alternate studs with a roller starting 6" from ceiling to within 6" of floor (Fig. B). Apply a 3" to 6" strip of adhesive to back of wallboard panel where it will contact stud (Fig. C).

Apply floor-to-ceiling height (less $\frac{1}{4}$ ") wallboard panels vertically with all edges centered on the stud flanges. Insert panel in aluminum ceiling trim (Fig. D) and make sure panel edge is aligned with metal studs and plumb. Screw-attach panel to floor runners with 1" Type S screws 12" o.c. and at third points along vertical board edges. Place screws $\frac{1}{4}$ " to $\frac{5}{16}$ " in from board edge to assure that battens will cover screw heads (Fig. D). At originating and terminating vertical studs and around door and borrowed light frames, attach panel with 1" Type S screws 12" o.c.



C



D

Where Aluminum Battens A-04 are spaced 24" o.c., screw-attach panels to studs at vertical third points instead of using adhesive, and fasten battens with 1" Type S screws 12" o.c. Fasteners at doors, terminals and runners are to be installed as described above.

Where a one-piece steel door frame is used, attach wallboard to metal studs adjacent to door frame using DWA-14 Adhesive. Apply a $\frac{3}{8}$ " bead of adhesive the full length of metal stud and located no more than $\frac{1}{2}$ " in from edge of open flange.

Fabricating Aluminum Components

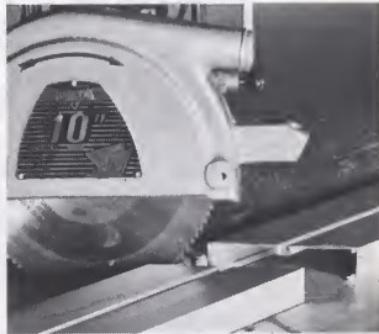
A. Cutting to length—Cut USG aluminum components to length accurately using a radial or bench-type power saw (Fig. E). Automobile motor oil will serve effectively as a lubricant. Hand sawing with a hack saw or power-driven sabre saw will not produce sufficiently accurate results.

B. Mitering—Miter cutting is accurately performed simply and easily with a power saw (Fig. F).

C. Coping Corners—Coping is required to form a corner in the rail cap or aluminum base plates without cutting through the face. Make a 45° cut to the point where the face will bend (Fig. G). Turn the part around and make another 45° cut to meet the first cut, slightly scoring underside of face to aid in bending (Fig. H). Heat the scored underside of face with a propane torch and bend to form the 90° corner.



E



F



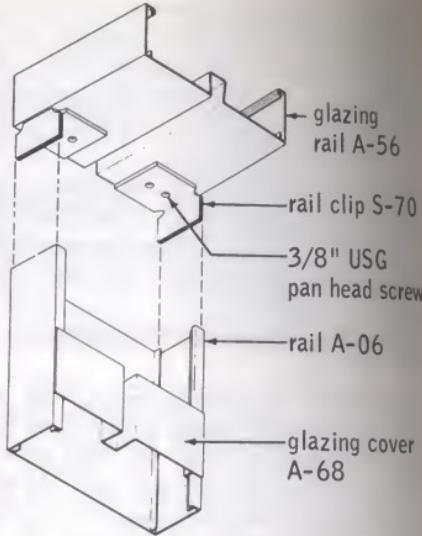
G



H



I



J

Door Assembly Erection—Trim the rough door opening first at both sides and then at the head with Rail A-06 cut to the opening dimension. Butt header trim to jamb trim. Do not miter. Use a finishing knife to guide the Rail A-06 over the board to prevent damage to wallboard panel (Fig. I). Screw-attach Door Stop A-72 to Rail A-06 with $\frac{7}{8}$ " Type S oval head finishing screws. Insert rubber door buttons in predrilled holes located on strike side of door stop.

For full-height door openings, trim the rough opening with continuous sections of Rail A-06 and Door Stop A-72 as described above. Set fixed transoms in place and securely pin to the Door Stop A-72 at ceiling line. Screw transom to door stop with $1\frac{5}{8}$ " Type S wood trim screws (see detail, page 198).

Borrowed Light Assembly Erection—Trim rough borrowed light opening with Glazing Rail A-56 for the vertical and head sections and Rail A-06 for the bottom horizontal sill section. Butt header and sill trim to jamb trim. Do not miter.

Fabricate intermediate mullions when required from Glazing Rail A-56 and Glazing Cover A-68. Position Glazing Rail A-56 vertically between top and bottom rails and attach to rails at each end with two Rail Clips S-70. Attach each Rail Clip with two $\frac{3}{8}$ " Type S-12 pan head screws per clip. Position Glazing Cover over Glazing Rail and snap in place (Fig. J).

Attach two Post Channels A-73A to bottom rail to provide glazing stops. Fasten with $1\frac{1}{4}$ " Type S bugle head cadmium plated finishing screws through counterbored holes 16" o.c.

Partition Terminal Erection—Finish partition terminals by fitting Rail A-06 over end of partition and securing top and bottom with two $\frac{7}{8}$ " Type S oval head finishing screws.



K

Aluminum Base Erection—Install metal base splice plates 24" o.c. and at corners, partition terminals and base splices with 1" Type S screws driven at downward angle into vertical flange of runner. Apply either 2½" or 4" Aluminum Base over splice plates and engage by tapping in place (Fig. K). Form exterior corners by coping (see page 191) and bending while applying heat with a propane torch to the back of the flange. Butt interior corners and splice base over splice plates. Adhesively attach base closure caps over ends of base where appropriate with caps snugly abutting vertical rails.

Partition Accessory Erection

Drive-In Ceiling Trim A-46—Install at ceiling line with ends abutting at grids. Drive flange between ceiling and DWR-212 runner with a plastic-faced hammer. **Picture Mold A-45**—Install horizontally at the ceiling line over wallboard with 1" Type S screws 12" o.c. **Interior Corner A-38**—Install vertically in one piece over wallboard at all interior corners with 1" Type S screws 12" o.c. **Exterior Corner A-03**—Install vertically in one piece over wallboard at all exterior corners with 1" Type S screws 12" o.c. (Fig. L). **Batten A-04**—Install in one piece to cover screw heads at vertical board joints and at intermediate studs when adhesive attachment is not used. Fasten with 1" Type S screws 12" o.c. (Fig. M). **Batten Insert**—Install in all Battens, Exterior and Interior Corners and Picture Moldings, (Fig. N).



L



M



N

Cornice Height (Unglazed) Partition

Stud System Erection—Align DWR-212 Metal Runners accurately at floor according to partition layout. Position metal runner (rough cornice cap) horizontally at correct height location and hold in alignment until intermediate studs are positioned. Position, align, and anchor stud system and frame the rough door opening the same as Ceiling Height partition.

Wallboard Erection—Apply wallboard vertically the same as shown for Ceiling Height Partition.

Cornice Cap Erection—Position Rail A-06 on top of the partition and tap in place with plastic or rubber mallet. Miter the rail at corners.

Door Assembly Erection—Trim the rough door opening using the same construction shown for the Ceiling Height Partition with the following exceptions: The metal runner, in head of door, must be snipped on both flanges and pushed into Rail A-06 to allow Plain Rail Cover A-70 to be snapped into place. Butt jamb trim to cornice cap, Rail A-06. Use the Plain Rail Cover as header trim and install last.

Partition Terminal Erection—Finish partition terminals by fitting floor-to-ceiling height Rail A-06 over end of partition. Secure bottom with two $\frac{7}{8}$ " Type S oval head finishing screws and top to ceiling using two Rail Clips S-70 appropriately fastened. Finish top portion of Rail with Plain Rail Cover A-70 snapped in place.

Aluminum Base Erection—Apply the same as for Ceiling Height Partition.

Partition Accessory Erection—Apply Battens, Batten Inserts, Interior and Exterior Corners the same as for Ceiling Height Partitions.

Cornice Height (Glazed) Partition

Stud System Erection—Align DWR-212 Metal Runners accurately at floor according to partition layout. Position metal runners horizontally at correct sill height and erect intermediate studs between sill height runner and floor runner. Position, align and anchor stud system same as for Ceiling Height Partition.

Rough Door Framing—Anchor runners to floor with two suitable fasteners at jambs. Rough frame the door opening with sill height jamb studs attached to floor and sill runner ends.

Wall Erection—Apply wallboard horizontally using the longest lengths possible. Place abutting end joints directly under borrowed light jambs or mullions for better appearance. Using

the same methods shown for the Ceiling Height Partition, fasten panels to studs, floor and sill runners with adhesive and type S screws; apply battens over end joints.

Sill Cap Erection—Position Rail A-06 over sill portion of partition and tap in place. Miter corners.

Glazing Corner Post Erection—Install Post A-73 at partition corners, plumb, and fasten between Rail A-06 and Glazing Rail A-56 (cornice cap) with Post Assembly S-36 and Post Plate S-71. Cut Post Channel A-73A to length and slide down groove in Post (see details page 200).

Cornice Cap Erection—Position Glazing Rail A-56 horizontally on top of partition to serve as a cornice cap and top glazing component. Miter the rail at corners and fasten to Post A-73 with Post Assembly.

Door Assembly Erection—Trim the jambs with Rail A-06 vertically positioned over wallboard and studs. Fasten each rail at bottom with two $\frac{7}{8}$ " Type S oval head finishing screws and at top with Rail Clips secured to Glazing Rail cornice cap. Close opposite side of jamb by snapping Glazing Rail Cover A-68 in place. Position and fasten Door Stop the same as for Ceiling Height Partitions.

Partition Terminal Erection—Finish partition terminals the same as for Unglazed Cornice Height Partition. Finish portion of Rail A-06 between sill cap and cornice cap with Glazing Rail Cover A-68 snapped in place.

Intermediate Mullion Erection—Drill holes and install Post Assembly S-36 and Post Plate S-71 vertically between sill cap and cornice cap. Cut mullion height pieces of Glazing Rail A-56 and Glazing Rail Cover A-68, position vertically around Post Assembly and snap together. Tighten Post Assembly nut.

Aluminum Base Erection—Install the same as for Ceiling Height Partition.

Partition Accessory Erection—Install Battens, Batten Inserts, Interior and Exterior Corners the same as for Ceiling Height Partitions. Finish cornice cap with Plain Rail Cover A-70, if desired, by snapping cover in place.

Glazing—Install glass using recommended glazing procedures. Fit Glazing Spline P-10 around glass on one side only and into mullions and cornice cap. On sill cap rest glass on blocking, and secure with Post Channels A-73A as glazing stops. Fasten channels 1" from ends and no more than 16" o.c. with $1\frac{1}{4}$ " Type S bugle head cadmium plated finishing screws set in counterbored holes.

Bank Rail Height Partition

Stud System Erection—For Bank Rail resting on the floor, erect stud system the same as for Glazed Cornice Height Partition except at terminals or openings where floor Clip S-11 must be suitably fastened through runner to floor and bolted to the terminal stud (see detail).

For Bank Rail raised above floor, center bottom metal runner within Rail A-06 and securely fasten assembly to floor through Pedestal A-74 with a $\frac{3}{8}$ " threaded rod (see details). At terminals and openings, bottom runner should extend $1\frac{1}{4}$ " beyond end of Rail A-06. Floor Clip S-11 is not required. Erect vertical studs and top runner the same as for Glazed Cornice Height Partition.

Wallboard Erection—Apply wallboard horizontally the same as for Glazed Cornice Height Partition.

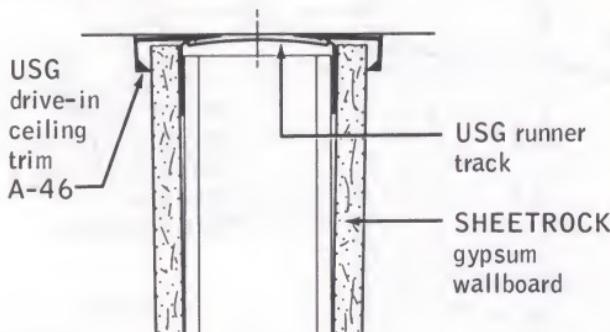
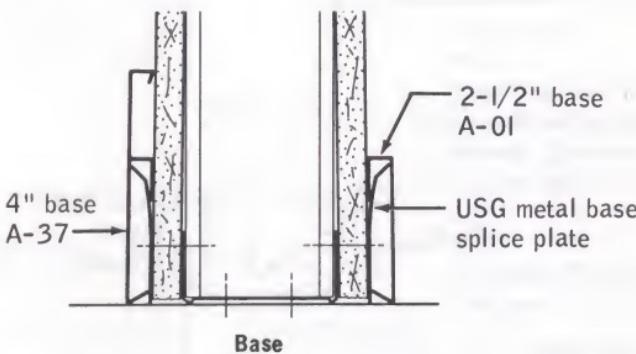
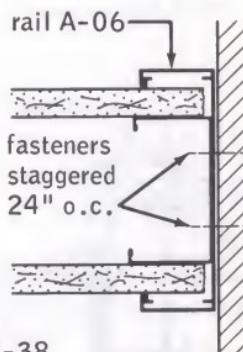
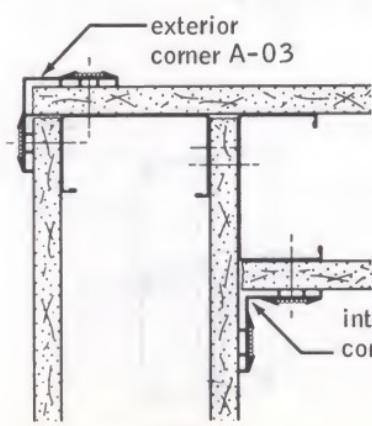
Top Rail and Terminal Erection—Install a continuous piece of Rail A-06 for top rail and terminal cap. Fabricate top corner by coping, heating with a propane torch and bending (see page 191). With bends formed, position Rail and tap in place with a plastic or rubber-faced mallet. Fasten bottom of terminal rail to the stud with two $\frac{7}{8}$ " Type S oval head finishing screws through counterbored holes.

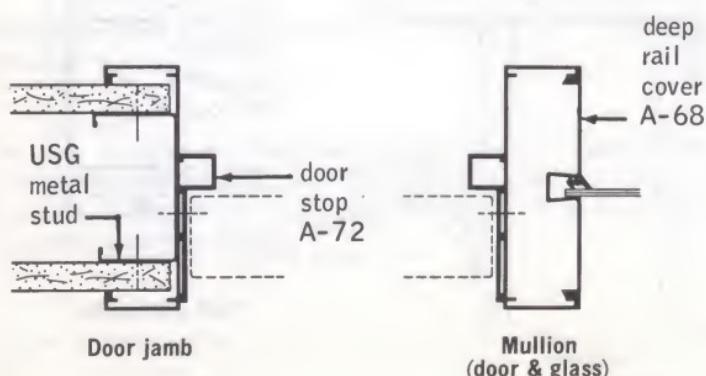
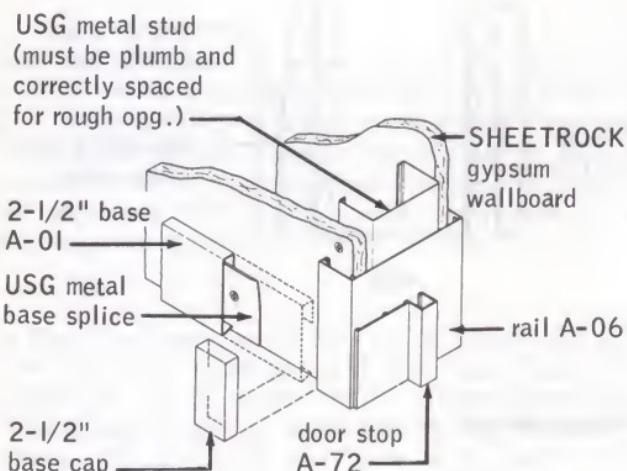
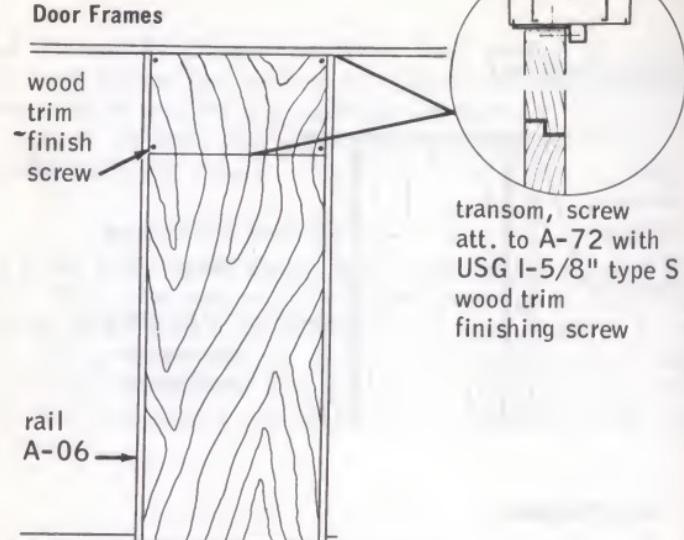
Glazing Post Erection—Install Post A-73, plumb and fasten to Rail A-06 with Post Assembly S-36 and Post Plate S-71. Cut Post Channel A-73A to length and slide down groove in Post. Attach Post Channel with groove up to top rail between glazing posts. Fasten with $\frac{3}{8}$ " Type S-12 pan head screws spaced 1" from ends of channel and no more than 16" o.c.

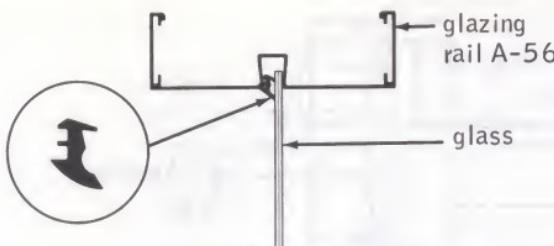
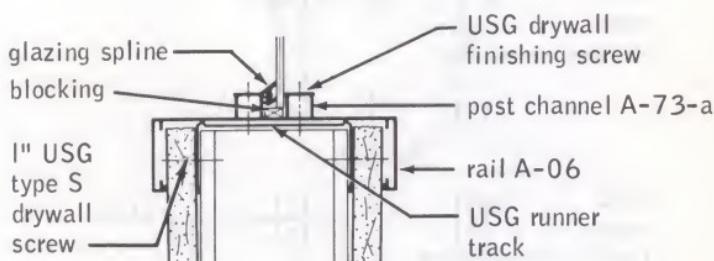
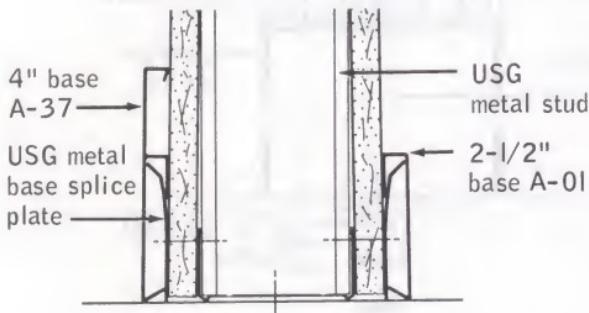
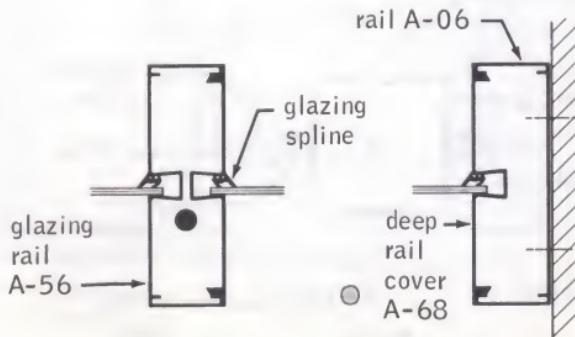
Aluminum Base Erection—Install the same as for Ceiling Height Partition.

Partition Accessory Erection—Install Battens, Batten Inserts, Interior and Exterior Corners the same as for Ceiling Height Partitions. Finish ends of Glazing Posts with Post Caps P-69 or P-70, adhesively attached.

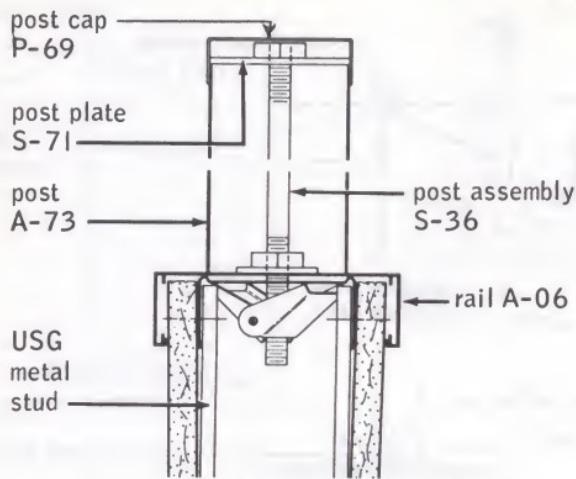
Glazing—Install glass using recommended glazing procedures and Glazing Spline P-10.

Ceiling height partition**Ceiling attachment****Floor attachment****Base****Wall plan sections****Wall intersection****Internal;
external corner**

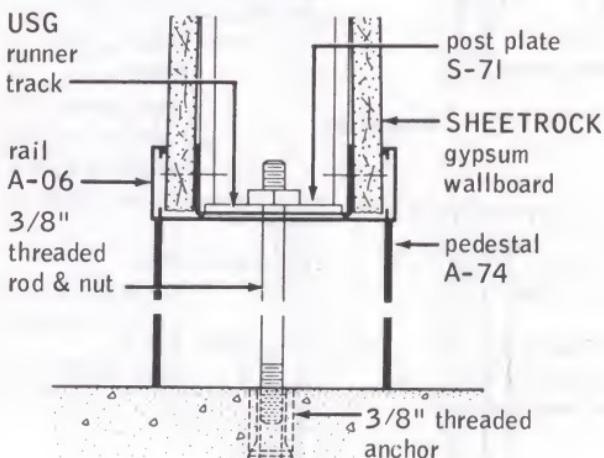
Cornice height partition

Cornice height partition**Cornice cap—
Window head****Window sill****Base****Mullion
(glass)****Wall
intersection**

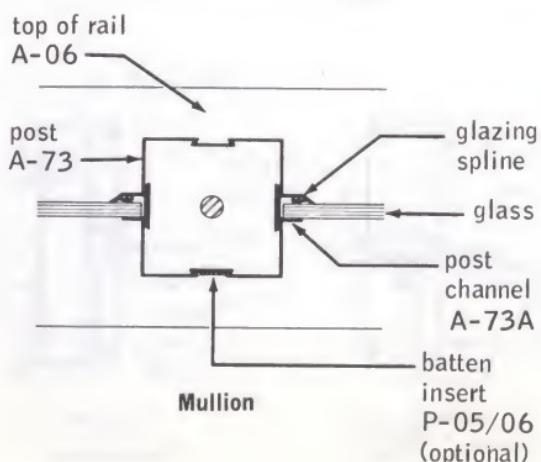
Bank rail height partition

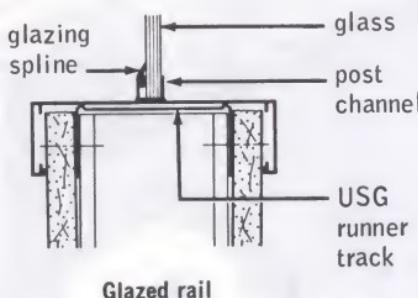
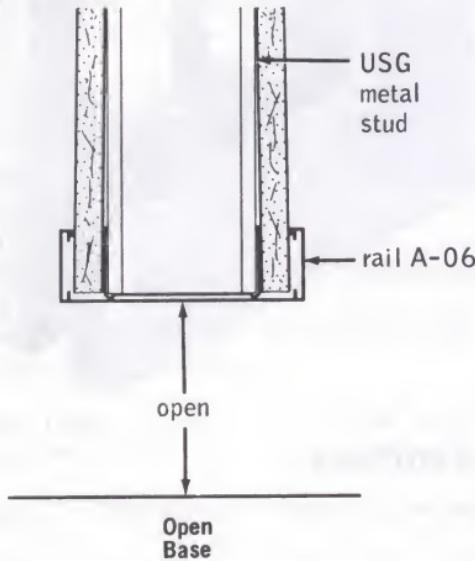
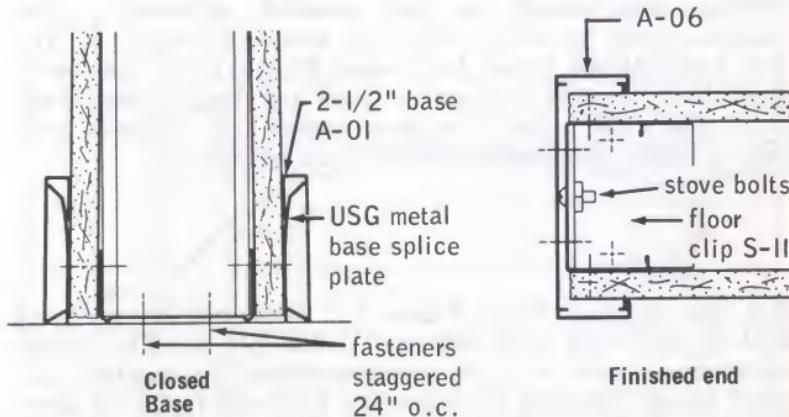


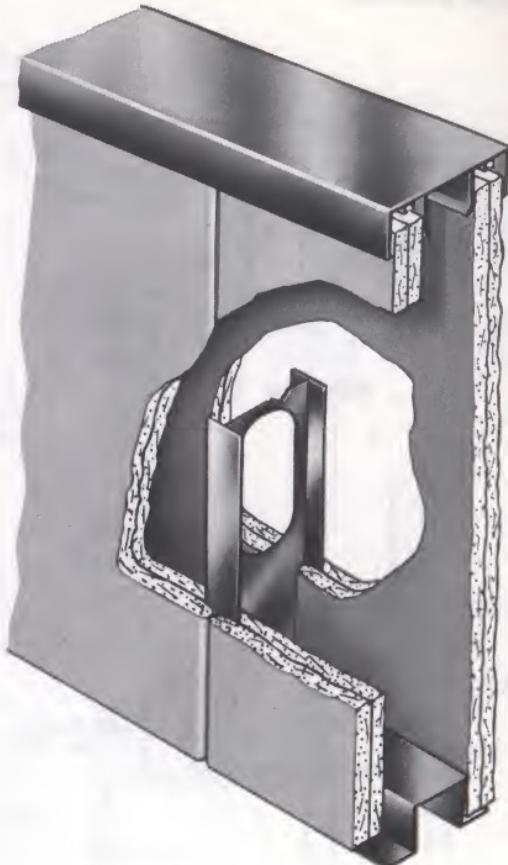
Post cap



Base



Bank rail height partition**Glazed rail****Open Base**



E-Z Wall Partitions

E-Z Wall Partitions are non-load bearing flush-panel type assemblies distinguished for their excellent appearance, quick erection, ready movability and high sound resistance—45 STC with THERMAFIBER Sound Attenuation Blanket in the stud cavity. Available in ceiling, cornice or bank rail height, these partitions offer a fast solution to space control and relocation problems in offices, commercial buildings and institutions.

E-Z Wall Gypsum Board Panels, $\frac{3}{4}$ " thick and 24" wide, are held in place with open-web steel H-stud 24" o.c. This hollow construction provides ample accommodation for standard electrical wiring. Openings for doors and borrowed lights are neatly formed and trimmed flush with E-Z Wall anodized aluminum components.

ADVANTAGES

Simplicity—Multi-purpose components assure faster, easier, more economical assembly, relocation and maintenance.

Workmanship—Installed by experienced partition contractors.

Fire Resistance—45 min. fire rating with insulating wool in the cavity; incombustible components.

Sound Control—45 STC with wool in stud cavity.

MATERIALS

1. E-Z Wall Panels— $\frac{3}{4}$ " thick, 24" wide, grooved beveled edges, manila or vinyl facings—lengths as required.

2. H-Studs—Studs punched with utility openings 12" o.c. and roll-formed from 23 ga. electro-galvanized steel.

3. Floor Runner—Roll-formed 23 ga. electro-galvanized steel with formed-in spacers for panel alignment.

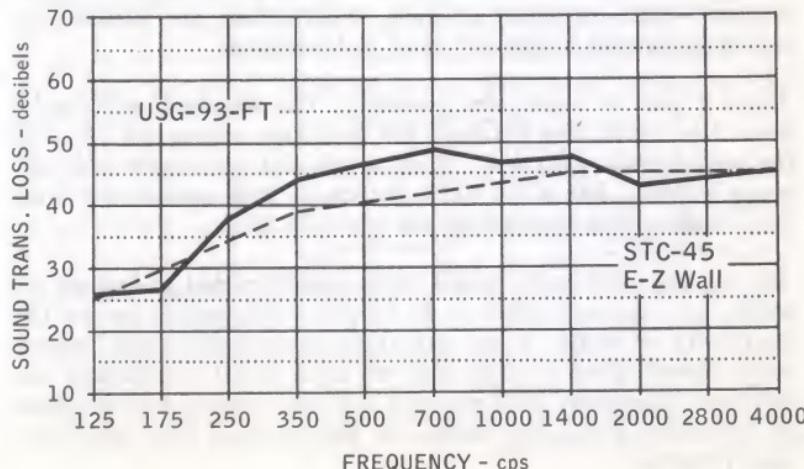
4. Ceiling Runner—One-piece extruded anodized aluminum.

5. Base—Top set resilient base or optional rigid 18 ga. metal base, $2\frac{1}{2}$ " high, $7/16$ " projection.

6. Aluminum Trim—Etched and anodized to provide a permanent neutral gray finish.

7. Insulation—2" THERMAFIBER Sound Attenuation Blanket.

The E-Z Wall Partition is covered by Patent No. 3,027,605.





VAUGHAN WALLS† Movable Gypsum Partitions

VAUGHAN WALLS are custom tailored solid-gypsum assemblies, movable and reusable, that offer fine appearance and performance similar to permanent partitions. Consisting of only two basic components—modular gypsum panels, floor and ceiling runners—these non-load bearing constructions are suitable for ceiling or cornice height and bank rail partitions.

Three types of walls are available: the standard wall—solid core, $2\frac{1}{4}$ " thick, has a 1-hour fire resistance rating and 36 STC; the sound wall—two $1\frac{1}{8}$ " thick semi-solid units with $1\frac{1}{8}$ " air space between has a 45 STC; the chase wall—semi-solid core, $2\frac{1}{4}$ " thick, offers reduced weight and a 36 STC.

The modular 24" wide panels, with edges beveled to feature the joints, can be assembled to fit height requirements up to 14'. Flexibility of finish is an important advantage—wood veneer, vinyl, fabric, glass or paint may be used. Metal components are extruded aluminum with exposed members etched and anodized to a neutral satin gray finish, or shop-primed steel ready for final painting.

†T.M. Reg. U.S. Pat. Off. by Vaughan Interior Walls, Inc.

ADVANTAGES

Fire Resistance—1 hour (with steel runners).

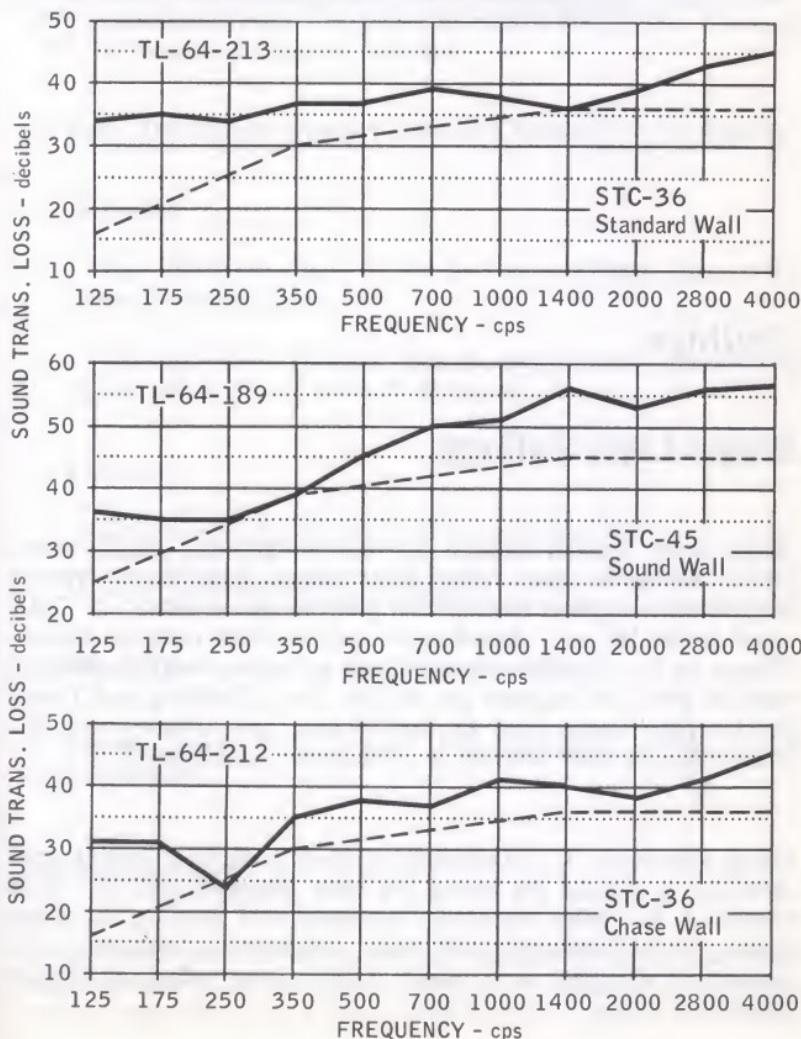
Sound Control—Sound Wall: 45 STC; Standard Wall and Chase Wall: 36 STC.

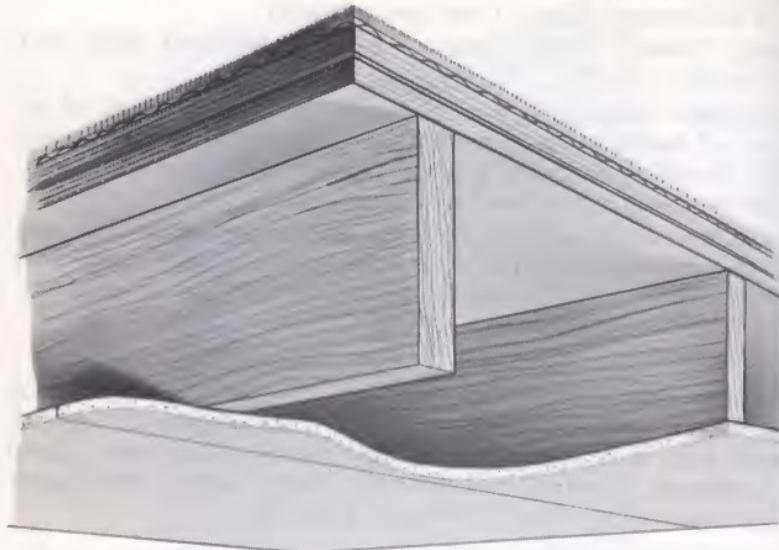
Versatility—Used in new construction or modernization of all types of buildings; wide variety of heights and finishes; complete flexibility in locating glazed panels and doors; accommodates electrical services easily.

Economy—Fabricated simply and rapidly from locally stocked parts; unexpected job problems and layout changes easily met without costly delays; readily adapted to new layouts with virtually 100% salvageability.

MATERIALS

Partition panels are jig-laminated into 24" nom. widths consist of VAUGHAN WALLS parts including 1" USG Gypsum Coreboard, faced both sides with $\frac{5}{8}$ " FIRECODE gypsum face panels. Metal components furnished by authorized erector comply with standards approved by Vaughan Interior Walls, Inc.





Ceilings

Single Layer Ceilings

Single layer drywall ceilings provide economical, quickly completed ceilings in wood frame construction. SHEETROCK Gypsum Wallboard is applied horizontally (across the supports) to 2x10 wood joists 16" o.c. Attachment may be with nails or screws. Where no fire rating is required the Adhesive Nail-On Method may be used. To upgrade job quality, Back-Blocking and Floating Interior Angles may be used. Joints and fasteners are finished with the PERF-A-TAPE or DURABOND Joint System.

Using FIRECODE "C" Wallboard in wood joist floor/ceiling construction, a 1-hour fire rating has been obtained with $\frac{1}{2}$ " thick board. A $\frac{5}{8}$ " thick FIRECODE assembly will provide the same rating. With Insulating (foil back) SHEETROCK Wallboard the system is effective as a vapor barrier and offers significant insulating value.

ADVANTAGES

Fire Resistance—1-hour rating with $\frac{1}{2}$ " FIRECODE "C" or $\frac{5}{8}$ " FIRECODE Wallboard; 45 min. with $\frac{1}{2}$ " FIRECODE board.

Versatile—Widely accepted for interior ceilings in all types of wood framed residential and commercial buildings.

Economical—Quickly erected using low cost materials.

MATERIALS

1. Gypsum Board—48" wide—($\frac{3}{8}$ ") ($\frac{1}{2}$ ") ($\frac{5}{8}$ ") thick Tapered Edge SHEETROCK (Regular) or (Insulating-foil back); ($\frac{1}{2}$) ($\frac{5}{8}$) thick SHEETROCK FIRECODE; $\frac{1}{2}$ " thick SHEETROCK FIRECODE "C" Wallboard—lengths as required.

2. Joint Treatment—PERF-A-TAPE or DURABOND Joint System.

3. Adhesive

—(for Back-Blocking System)—PERF-A-TAPE Joint Compound (embedding type).

—(for Adhesive Nail-On Board Application)—SHEETROCK Brand DWA-14 or DWA-10 Adhesive.

4. Fasteners

—Screws— $1\frac{1}{4}$ " USG Drywall Screw Type W.

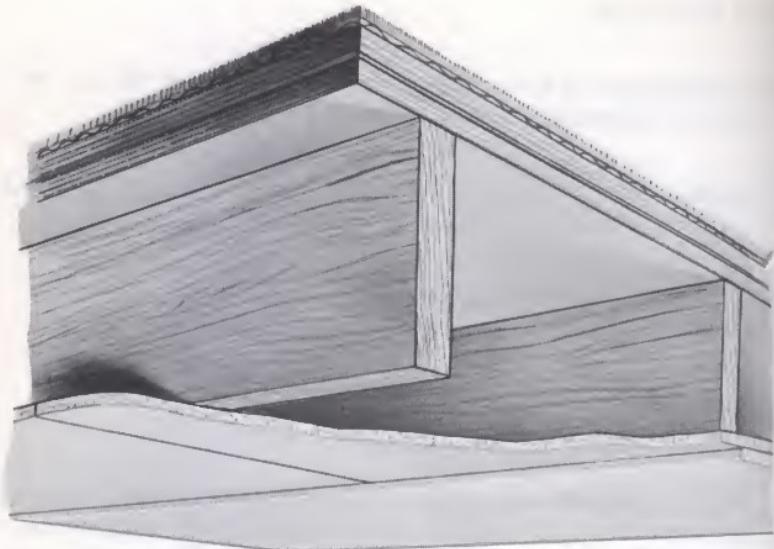
—Nails (choose type from page 46).

5. Metal Trim—(choose type from page 32).

6. Corner Bead—DUR-A-BEAD, PERF-A-BEAD, ECONO Corner Reinforcement.

INSTALLATION

Install wallboard, fasteners, metal accessories and joint treatment according to methods described in Chapter 3. For fire-rated construction space nails not to exceed 6" o.c.



Double Layer Ceilings

In wood-framed construction, double layer systems create the finest ceiling surfaces available with gypsum wallboard. By job-laminating SHEETROCK Wallboard to a base layer of BAXBORD Gypsum Backing Board, the possibility of imperfections due to ridging and surface fasteners is minimized. Greater strength, fire protection, and resistance to sound transmission are also added.

Double layer gypsum wallboard also has been used extensively in electric cable radiant heated ceilings. Regular SHEETROCK Wallboard is the base layer, heating cables are embedded in a filler and a SHEETROCK face layer is attached directly to the adhesive filler. See Chapter 3 for particulars.

ADVANTAGES

Fast Erection—Cuts building time; permits early occupancy.

Low Maintenance—Easy decoration; reduced possibility of fastener "pops" and discoloration over fastener heads.

Economical—Low-cost materials produce greater strength, fire and sound resistance.

MATERIALS

- 1. Faceboards**—48" wide—($\frac{3}{8}$ ") ($\frac{1}{2}$ ") ($\frac{5}{8}$ ") thick Tapered Edge SHEETROCK; ($\frac{1}{2}$ ") ($\frac{5}{8}$ ") thick SHEETROCK FIRECODE—lengths as required.
- 2. Backing Board**—48" wide—($\frac{3}{8}$ ") ($\frac{1}{2}$ ") ($\frac{5}{8}$ ") thick (Tapered Edge) (Insulating) SHEETROCK; ($\frac{1}{2}$ ") ($\frac{5}{8}$ ") SHEETROCK FIRECODE; ($\frac{3}{8}$ ") ($\frac{1}{2}$ ") ($\frac{5}{8}$ ") thick BAXBORD Gypsum Backing Board; ($\frac{1}{2}$ ") ($\frac{5}{8}$ ") thick BAXBORD FIRECODE—lengths as required.
- 3. Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.
- 4. Adhesive**—USG Laminating Adhesive, PERF-A-TAPE Joint Compound (embedding type).
- 5. Fasteners**
 - Screws—USG Drywall Screws $1\frac{1}{4}$ " Type W, $1\frac{1}{2}$ " Type G.
 - Nails—(choose type from Chapter 2).
 - Staples—16 ga. flat galvanized wire, $\frac{1}{2}$ " wide, (1") ($1\frac{1}{8}$ ") ($1\frac{1}{4}$) long with divergent points.
- 6. Metal Trim**—(choose type from page 32).
- 7. Corner Bead**—DUR-A-BEAD, PERF-A-BEAD or ECONO Corner Reinforcement.

INSTALLATION

Install backing boards, face boards, fasteners, metal accessories, caulking, and joint treatment according to methods described in Chapter 3.



Resilient Channel Ceilings

Ceiling assemblies using the RC-1 Resilient Channel provide low cost and superior sound isolation plus a 1-hour fire rating for wood joist floor/ceiling construction—qualities particularly needed in motels and apartments. The RC-1 Resilient Channels are attached 24" o.c. at right angles to the wood joists with 1 $\frac{1}{4}$ " Type W drywall screws; wallboard is screw-attached with 1" Type S drywall screws.

The one-hour fire rating for wood joist floor-ceiling construction has been obtained by using 1/2" FIRECODE "C" Wallboard and by 5/8" FIRECODE. The system has an effective vapor barrier and provides significant insulating value when Insulating (foil-back) SHEETROCK is used. The assembly should not be used beneath highly flexible floor joists.

ADVANTAGES

Fire Resistance—1-hour rating with 1/2" FIRECODE "C" or 5/8" FIRECODE Wallboard.

Sound Control—Resilient attachment provides superior sound transmission loss values.

Economical—Low-cost materials; speedy erection.

MATERIALS

- Gypsum Board**—48" wide—(1/2") (5/8") thick Tapered Edge SHEETROCK (Regular) or (Insulating—foil back); 1/2" thick SHEETROCK FIRECODE "C"; 5/8" thick SHEETROCK FIRECODE Wallboard—lengths as required.
- Resilient Channels**—RC-1 SHEETROCK Resilient Channel.
- Screws**—USG Drywall Screws, 1 $\frac{1}{4}$ " Type W, 1" Type S.

4. Joint Treatment—PERF-A-TAPE or DURABOND Joint System.
5. Adhesive—(for Back-Blocking)—PERF-A-TAPE Joint Compound (embedding type).
6. Metal Trim—(choose from page 32).

INSTALLATION

Resilient Channels—Attach RC-1 SHEETROCK Resilient Channels at right angles to wood joists. Use $1\frac{1}{4}$ " Type W drywall screws driven through the pre-punched holes in the channel flange. *Do not use nails.* Fasten channel to joist at each channel-joist intersection.

Locate channels within 6" of the wall-ceiling intersection and no more than 24" o.c. Extend channels into all corners and fasten to corner framing. Do not cantilever channels more than 6". Splice channel directly under joists by nesting the channels and screwing through both flanges to the support.

Wallboard—Apply wallboard of maximum practical length with the long dimension at right angles to the resilient channels with end joints staggered and neatly fitted. Attach wallboard with 1" Type S drywall screws spaced 12" o.c. in the field of the board and along abutting ends. Center end over the web surface of the resilient channel or center midway between channels and back-block with a minimum 8" wide strip of $\frac{3}{8}$ " gypsum board. Properly support wallboard around all cut-outs and openings in the ceiling.

Finishing Ceiling—Apply metal trim and caulking; treat all joints and fastener heads as directed in Chapter 3.





Drywall Furring Channel Ceilings

Drywall Furring Channel Systems conceal and protect structural and mechanical elements within a lightweight fire resistant ceiling of gypsum board. USG Drywall Furring Channels, to which the wallboard is screw-attached, are wire-tied to bar joists or clipped to conventional 1½" main runner channel grillage. For long-span requirements beneath large ducts or pipes, USG Metal Studs are substituted for furring channels (see table below for component spacing). With Insulating (foil back) SHEETROCK Wallboard the system is effective as a vapor barrier and provides significant insulating value. Lower cost BAXBORD Gypsum Backing Board provides a firm base for acoustical tile adhesively applied.

FIRE AND SOUND RATED CONSTRUCTION

Construction (A): 5/8" SHEETROCK FIRECODE "C" Wallboard; steel DWC Furring Channels 24" o.c.; wallboard attached with 1" Type S drywall screws 12" o.c.; joints exposed or finished with PERF-A-TAPE Joint System; 3" concrete on riblath over bar joists. **Construction (B):** Same as (A) with 2½" concrete and ½" SHEETROCK FIRECODE "C" Wallboard. **Construction (C):** Same as (B) with 5/8" SHEETROCK FIRECODE "B" Wallboard. **Construction (D):** 5/8" SHEETROCK FIRECODE Wallboard; DWC Channels 12" o.c.; wallboard attached with 1" Type S screws 8" o.c.; joints finished; 2½" concrete on riblath over bar joists. **Construction (E):** 5/8" SHEETROCK FIRECODE Wallboard; DWC channels 24" o.c.; wallboard attached with 1" Type S screws 12" o.c.; joints finished; 2" concrete on riblath over bar joists.

Component Spacing

Type Furring Member	Ceiling Systems—Component spacing					
	Furring Member c. to c. Spacing		Main Support Member c. to c. Spacing		Hanger Spacing c. to c.	
	For wallboard thickness of:					
DWC Furring Channel	$\frac{3}{8}$ " 16"	$\frac{1}{2}$ " 24"	$\frac{5}{8}$ " 24"	$\frac{3}{8}$ " 5'0"	$\frac{1}{2}$ " 4'0"	$\frac{5}{8}$ " 4'0"
USG Metal Stud	1 $\frac{1}{8}$ " erected with both flanges up and against main support member	16"	24"	24"	7'0"	6'0"
	2 $\frac{1}{2}$ "	16"	24"	24"	—	6'0"
	3 $\frac{5}{8}$ "	16"	24"	24"	—	8'0"

ADVANTAGES

Fire Resistance—3-hour fire rating with Construction (A), includes 3-hour beam; 2-hour rating with (B), (C) and (D); 1 $\frac{1}{2}$ "-hour rating with (E).

Versatility—Used in virtually all types of new construction and modernization.

Economy—Low cost materials. Few components and simple installation result in fast erection.

MATERIALS

1. Gypsum Board—($\frac{1}{2}$ ") ($\frac{5}{8}$ ") thick, 48" wide Tapered Edge SHEETROCK, (Regular) (Insulating—foil back) (FIRECODE) (FIRECODE "B") (FIRECODE "C") Gypsum Wallboard, or BAXBORD Gypsum Backing Board—lengths as required.

2. Furring Channels—USG DWC Drywall Furring Channel and/or USG Metal Studs—DWS-158 (1 $\frac{1}{8}$ ")—212 (2 $\frac{1}{2}$ ")—358 (3 $\frac{5}{8}$ ").

3. Fasteners—USG Drywall Screws, 1" Type S.

4. Joint Treatment—PERF-A-TAPE or DURABOND Joint System.

5. Metal Trim—(choose type from page 32).

6. Grillage Accessories

—Drywall Furring Channel Clip.

—1 $\frac{1}{2}$ " Cold Rolled Channels.

—9 ga. Galvanized Hanger Wire.

—16 ga. Galvanized Tie Wire.

INSTALLATION

Install Main Runner Channels—Anchor 9 ga. galvanized hanger wires to structural frame or embed them in concrete slabs. Space hangers at no more than 4'0" intervals along the 1½" cold rolled channels used as main runners. Determine main runner spacing from Component Spacing Table, page 213. Level runners and saddle tie hangers to runners. Place runner channels within 6" of walls to support furring channel ends. Keep main runners from contacting abutting masonry walls.

Fasten Furring Channels—Position DWC Furring Channels (or USG Metal Studs) at right angles to 1½" main runner channels and space according to gypsum board thickness or specifications.

Attach furring channels securely to main runners with DWC Furring Channel Clips or saddle tie to main runners or support members with two strands of 16 ga. galvanized tie wire (see illustration below). Install Furring Channel Clips on alternate sides of main runners. Wire tie furring channel to main runner when clips cannot be alternated. When using USG Metal Studs, install with one flange against the main supports or runners to provide a firmer support for attachment of wallboard and to minimize distortion or twisting. Keep furring channels and studs from contacting abutting masonry walls.

At light troffers or any openings that interrupt the main runner or furring channels, reinforce grillage with ¾" cold rolled channels wire tied atop and parallel to the main runner channels.



Furring Channel Splices—Long runs of USG DWC Furring Channels or DWS Metal Studs used as ceiling furring members must be end-spliced. Nest one channel or stud inside the other to a depth of at least 8" and securely wire-tie together at center of splice (see illustration above). When USG Metal Studs are

installed, splice them by springing open flanges of one stud and inserting other stud into it to a depth of at least 8". Securely wire-tie together at center of splice. Do not screw or permanently fasten end splices together.

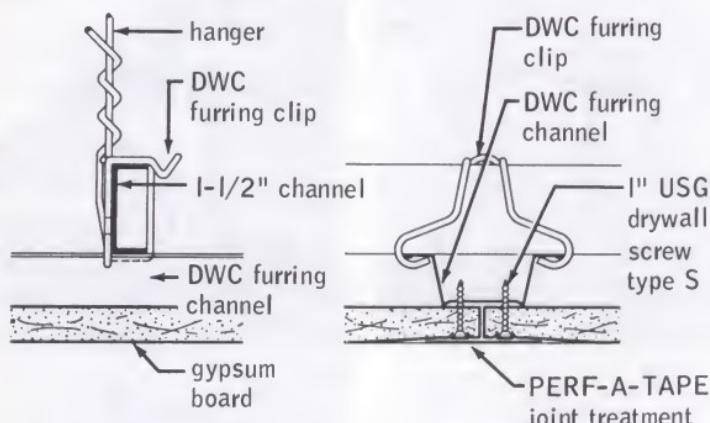
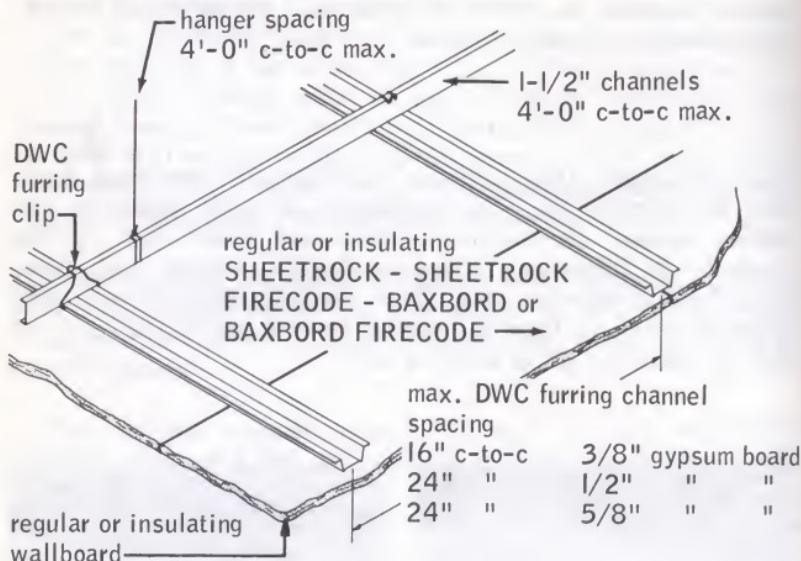
Panel Erection—Apply gypsum wallboard of maximum practical length with the long dimension at right angles to the furring channel (see below). Center end joints over furring channels; fit joints neatly and accurately; stagger end joints from those in adjacent panel rows. Fasten wallboard to furring channels with 1" Type S drywall screws spaced 12" o.c. in field of board and along abutting ends.



Back-Blocking Technique—When a fire-rated method of back-blocking is desired, float wallboard end joints between furring channels. Place a 5' length of DWC Furring Channel over and parallel to each end joint where one of the end joint-panels is installed (see above). Six inches of channel must rest on each wallboard panel adjacent to end joint-panels. While holding end joint-panel and furring channel firmly together, fasten them with 1" Type S drywall screws at 12" intervals. Install mating end joint-panel and fasten to 5' furring channel in same way. It is not necessary to wire-tie furring channel to carrying channels.

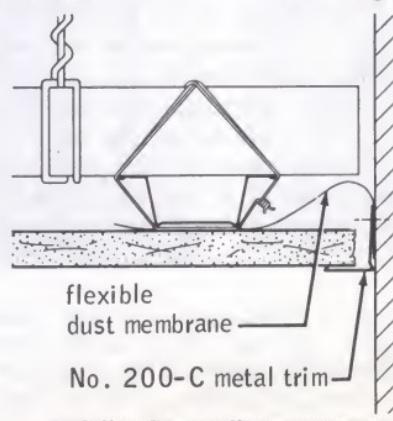
Finishing Ceiling—Apply metal trim, caulk around openings and at perimeter, treat all joints, fastener heads and trim as directed in Chapter 3.

Suspended ceiling
DWC Furring Channel

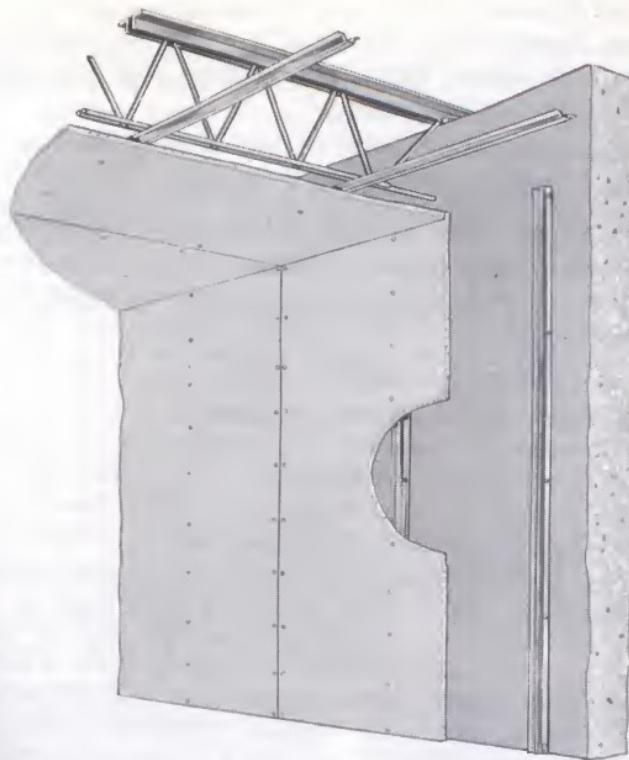


**Section parallel
to furring channel**

**Section transverse
to furring channel**



Isolation from walls or columns



Exterior Walls and Furring

Drywall Furring Channel

Drywall Furring of exterior masonry walls is quickly accomplished by using USG Drywall Furring Channels to which the wallboard is screw-attached. An effective vapor barrier and significant insulating value are added to walls by using Insulating (foil back) SHEETROCK Wallboard.

The furring channels are attached directly to virtually any type of masonry—brick, tile, gypsum tile, monolithic concrete. To provide additional space for pipes, conduits or ducts the metal channel may be furred out up to 3" with horizontal $\frac{3}{4}$ " cold rolled channels wire-tied to adjustable wall furring brackets. This latter furred construction limited to 12' height; no limiting height for direct attachment.

ADVANTAGES

Versatility—Suitable for new construction or remodeling; used with single or double layer construction over masonry walls.

Insulation and Vapor Barrier—Highly effective with Insulating SHEETROCK facings.

Economy—Simplified components and installation procedures provide one of lowest-cost exterior furring systems.

MATERIALS

1. **Gypsum Board**—($\frac{3}{8}$ ") ($\frac{1}{2}$ ") ($\frac{5}{8}$ ") thick, 48" wide Tapered Edge SHEETROCK, (Regular) (Insulating—foil back) Gypsum Wallboard—lengths as required.
2. **Furring Channel**—USG DWC Drywall Furring Channel.
3. **Fastener**—USG Drywall Screws, 1" Type S.
4. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.
5. **Metal Trim**—(choose type from page 32).
6. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD or ECONO Corner Reinforcement.
7. **Adjustable Furring Accessories**
 - USG Adjustable Wall Furring Bracket.
 - $\frac{3}{4}$ " Cold Rolled Channels.
 - 16 or 18 ga. Galvanized Tie Wire.

INSTALLATION

Furring Channel Erection—Direct Attachment

Attach DWC Furring Channels to masonry or concrete surfaces, either vertically or horizontally, spaced no more than 16" o.c. for $\frac{3}{8}$ " thick wallboard and 24" o.c. for $\frac{1}{2}$ " and $\frac{5}{8}$ " thick wallboard. For channels positioned horizontally attach a furring channel not more than 4" from both the floor line and the ceiling line. Secure channels with fasteners occurring on alternate channel flanges and spaced 24" o.c. Use a 2" cut nail in mortar joints of brick, clay tile or concrete block or in the field of lightweight aggregate block; $\frac{5}{8}$ " concrete stub nail or power driven fasteners in monolithic concrete (see Fig. A).

Attach mitered furring channels horizontally around masonry corners at window locations. To miter channels, make two 45° cuts in each wing flange of channel with a hack saw or sheet metal snips, but do not cut into web. Bend web until cut edges of wing flanges touch each other and channel is formed in an "L" shape (see Fig. B).



Fig. A



Fig. B

Furring Channel Erection—Wall Furring Bracket

Attach USG Adjustable Wall Furring Brackets, with serrated edges faced upward, to masonry wall in following spacing pattern: 48" o.c. vertically, 6" maximum from floor and ceiling, 36" o.c. horizontally, 4" maximum from columns or other abutting construction, and as required above and below windows. Fasten each bracket through hole closest to serrated edges. Use 2" cut nails in mortar joints of brick, clay tile, cement block, or in field of lightweight aggregate blocks; use $\frac{5}{8}$ " concrete stub nails or power driven fasteners in monolithic concrete. Lay $\frac{3}{4}$ " cold-rolled channels, horizontally, on furring brackets so that channel flanges engage serrated edges of bracket. Be certain each channel is plumbed to a line with ceiling and base channels. Wire-tie cold-rolled channels to each bracket with a double strand of 16 ga. or a triple strand of 18 ga. wire. Bend each excess bracket length down and inward toward wall. Vertically position DWC Furring Channels with wing flanges against cold-rolled channels and space them a maximum of 16" o.c. for $\frac{3}{8}$ " thick wallboard and 24" o.c. for $\frac{1}{2}$ " or $\frac{5}{8}$ " thick wallboard. Wire-tie each furring channel-cold-rolled channel intersection with a double strand of 16 ga. or a triple strand of 18 ga. wire (see Fig. C).



Fig. C



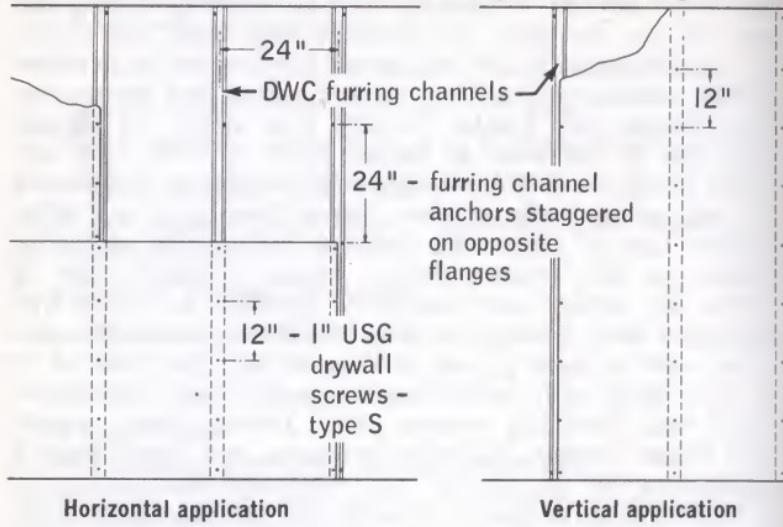
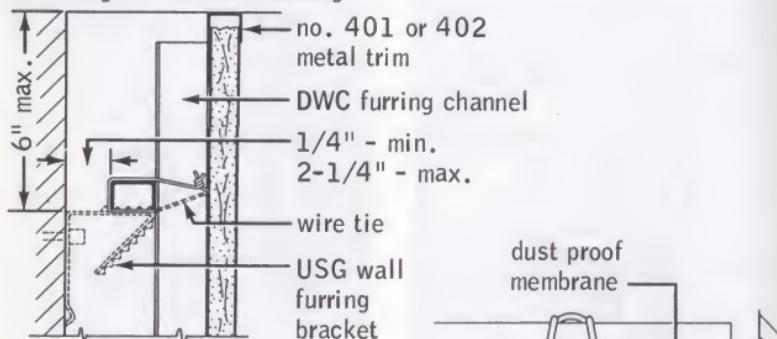
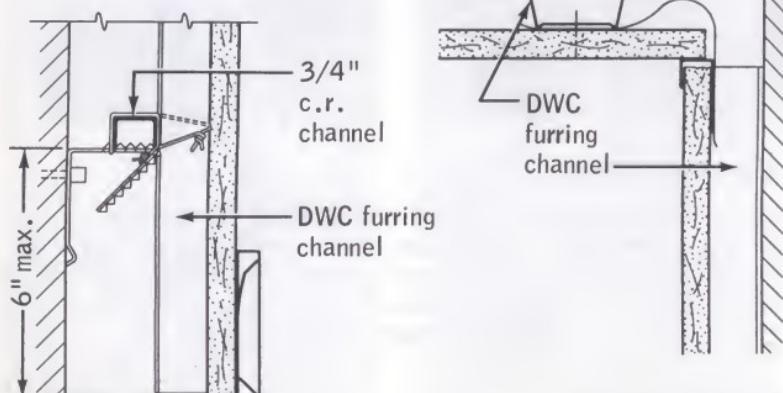
Fig. D

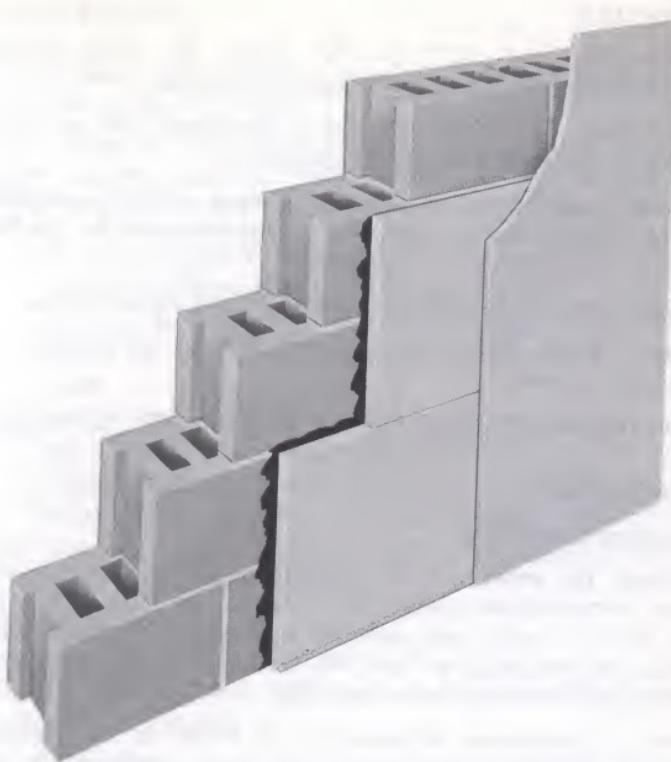
Wallboard Erection

Apply Insulating (foil back) SHEETROCK Wallboard to the furring channel either horizontally or vertically and with the foil against the channels. Center and neatly fit abutting end or edge joints over furring channels with end joints staggered. Fasten with 1" Type S drywall screws spaced 12" o.c. (see Fig. D).

Finishing Furring

Apply metal trim and corner bead and treat all joints, fastener heads and trim as directed in Chapter 3.

Wall elevation**SHEETROCK gypsum wallboard —reg. or insulating****Adjustable wall furring****rough or finished ceiling****Ceiling attachment****Floor attachment & base****Suspended ceiling**



Drywall and Rigid Foam Insulation Furring

A highly efficient wall furring assembly consists of SHEETROCK Wallboard applied vertically and adhesively bonded to Styrofoam FR insulation. The Styrofoam, in 1½", 2", or 3" thickness, is attached to unit masonry or concrete walls with portland cement mortar or modified Styrotac bonding adhesive.

This system provides a self-furred solid backup for SHEETROCK Wallboard and a fully insulated wall. It has excellent insulation values plus an effective vapor barrier. Installed costs are competitive with many non-insulated furred walls.

ADVANTAGES

Insulation—High thermal insulation value.

Vapor Barrier—Styrofoam is unaffected by water or water vapor, so is an ideal vapor barrier.

Flame Retardant—Styrofoam FR meets ASTM requirements for self-extinguishing plastics.

Economy—Simple components; fast erection; lightweight for possible structural savings.

MATERIALS

1. **Faceboards**— $\frac{3}{8}$ ", $\frac{1}{2}$ ", or $\frac{5}{8}$ " thick, 48" wide Tapered Edge SHEETROCK Wallboard—lengths as required.
2. **Insulation**—(1") (1½") (2") (3") Styrofoam FR, as manufactured by the Dow Chemical Company.
3. **Adhesive**—Styrotac Bonding Adhesive and/or Additive, Styrocrete Latex Mortar Additive, as manufactured by the Dow Chemical Company.
4. **Metal Trim**—#400, #401, or #402 USG Metal Trim.
5. **Corner Bead**—DUR-A-BEAD, PERF-A-BEAD or ECONO Corner Reinforcement.
6. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.

INSTALLATION

Application Conditions

Styrofoam FR must not be applied to masonry walls when outdoor temperatures during the installation period may fall below 20°F. Provide and maintain a minimum temperature of 55°F. in the building at least 48 hours prior to, during and after the application of Styrofoam FR.

Maintain a minimum temperature of 55°F. in the structure during the wallboard application and joint treatment. Provide ventilation to eliminate excessive moisture.

Generally, SHEETROCK Wallboard can be bonded on Styrofoam FR 24 hours after foam installation. However, when outdoor temperatures are below 50°F. during and after application of Styrofoam FR, allow 48 to 72 hours for adhesive to develop bond strength before application of the SHEETROCK Gypsum Wallboard. Once Styrofoam FR is applied to the wall, the wall and the adhesive are isolated from any source of heat from within the building. Therefore, a longer time is required for the adhesive to develop adequate bond strength.

Preparations

Mortar joints on surface of unit masonry to which Styrofoam FR is to be bonded should be cut flush with masonry to provide an even surface. The wall surface should be plumb, true to dimensions, and clean. Old or dirty masonry must be hosed, swept and wiped down to remove loose material. Form mark protrusions must be removed from poured or precast concrete; form release agents must be removed.

Prior to installation, attach wood nailer strips by mechanical means to the wall surface at base and wall-ceiling junctions and wherever required for subsequent attachment of moldings, trim, casings, base, cabinets, heavy drapes, or other heavy wall fixtures. These nailers may also be used to receive temporary mechanical fasteners to aid in positioning the wallboard until the adhesive has set.

Material Selection

Unit Masonry—Use portland cement mortar or Styrotac Bonding Adhesive. See (1) below.

Poured Concrete—Use Styrotac Bonding Adhesive or portland cement mortar modified with Styrocrete for architecturally poured concrete or pre-cast concrete. See (2) and (3) below.

- (1) Styrotac Bonding Adhesive is furnished in 50-lb. bags ready for mixing with water at job site.

Styrotac Bonding Adhesive Concentrate is also available in 1½-lb. bags ready for mixing with water, sand and water.

- (2) Modify 50-lb. bag of Styrotac Bonding Adhesive by adding 4 qts. of Styrocrete. Modify 1½-lb. bag of Styrotac Bonding Adhesive Concentrate by adding 5 qts. Styrocrete. In both cases, add water to obtain proper workability.
- (3) Styrocrete Latex Mortar Additive increases the adhesion of portland cement mortar.

Application Methods

Push-Box—Apply $\frac{1}{4}$ " thick layer of portland cement mortar, or mortar modified with Styrocrete to Styrofoam FR by means of a push-box (Fig. A).

Spot Application—Apply Styrotac or Styrotac modified with Styrocrete to the entire surface of the Styrofoam FR board using spots of adhesive 2" to 3" across, $\frac{1}{2}$ " to 1" peak height and spaced approximately 8" o.c. (Fig. B).

Notched Spreader—Apply Styrotac or Styrotac modified with Styrocrete to wall using a notched hand spreader or to the Styrofoam FR using a notched doctor blade and push-box. Use spreaders with notches spaced $3\frac{1}{2}$ " o.c. and each notch to be as shown in Fig. C.

For more detailed mixing and application instruction refer to Technical Data Sheets published by Dow Chemical Company, Midland, Mich.



Fig. A



Fig. B

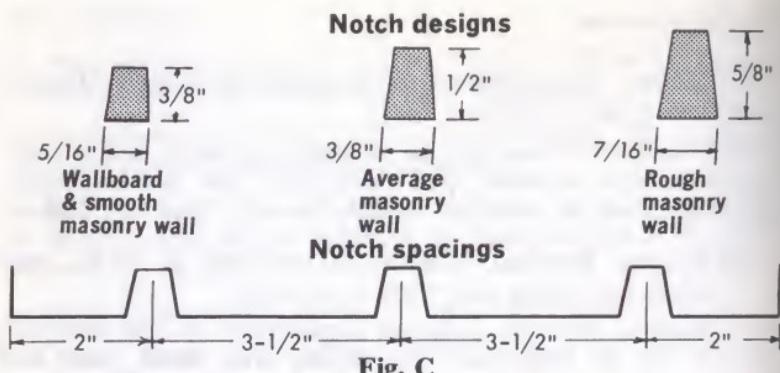


Fig. C

Styrofoam FR Erection

When preparations are complete, bond the desired thickness of Styrofoam FR directly to the masonry wall. Install foam horizontally to wall surface, butt all edges tightly and stagger all vertical joints. Apply firm hand pressure over board surface to effect bond, and level board as required. Slight vertical and/or lateral agitation of Styrofoam helps in placement. Place Styrofoam FR on wall *within 20 minutes* after adhesive application. When the adhesive has been modified with Styrocrete Latex Mortar Additive, place Styrofoam FR on wall *within 10 min.*

Wallboard Erection

Cut floor-to-ceiling height panels for vertical application. Allow for a continuous clearance ($\frac{1}{8}$ " to $\frac{1}{4}$ ") at the floor. A minimum of 24 hours after Styrofoam FR has been installed, bond SHEETROCK Wallboard directly on the foam with Styrotac Bonding Adhesive. Use either the spot application or notched spreader method for applying adhesive.

Spot Application Method—Spot apply Styrotac to entire back surface of SHEETROCK and strip Styrotac lightly along wallboard edges. Adhesive spots should be 2" to 3" across, $\frac{1}{2}$ " peak height and spaced approximately 8" to 12" o.c. (Fig. D).

Notched Spreader Method—Spread entire back surface of wallboard or wall surface of Styrofoam FR with Styrotac using a notched spreader. Notches should be $\frac{3}{8}$ " high and $\frac{5}{16}$ " wide at the base, slightly tapered and spaced $3\frac{1}{2}$ " o.c. Adhesive ribbons may run in any direction convenient to application (Fig. E).



Fig. D



Fig. E

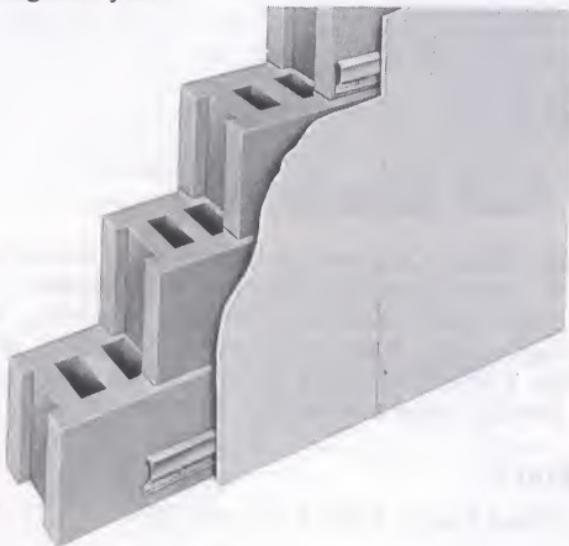
After adhesive is applied, place SHEETROCK Gypsum Wallboard with long (tapered) edges vertically against the Styrofoam FR, apply firm hand pressure over board surface to effect bond and level board. Use slight vertical and/or lateral agitation to help in placement. After adhesive application, place SHEETROCK Wallboard on Styrofoam FR *within 20 min.* When Styrocrete Latex Mortar Additive is used place wallboard within *10 min.* If panel touches floor, cut it back to provide *1/8" min.* clearance.

Install control joints in the SHEETROCK Wallboard finish (USG metal trim back-to-back), coinciding with control joints in exterior wall.

Finishing

After Styrotac is well set (minimum of 24 hours), forming a firm bond between the SHEETROCK Wallboard and Styrofoam FR, finish SHEETROCK in conventional manner, taking care not to severely shock the surface by impact for at least 72 hours.

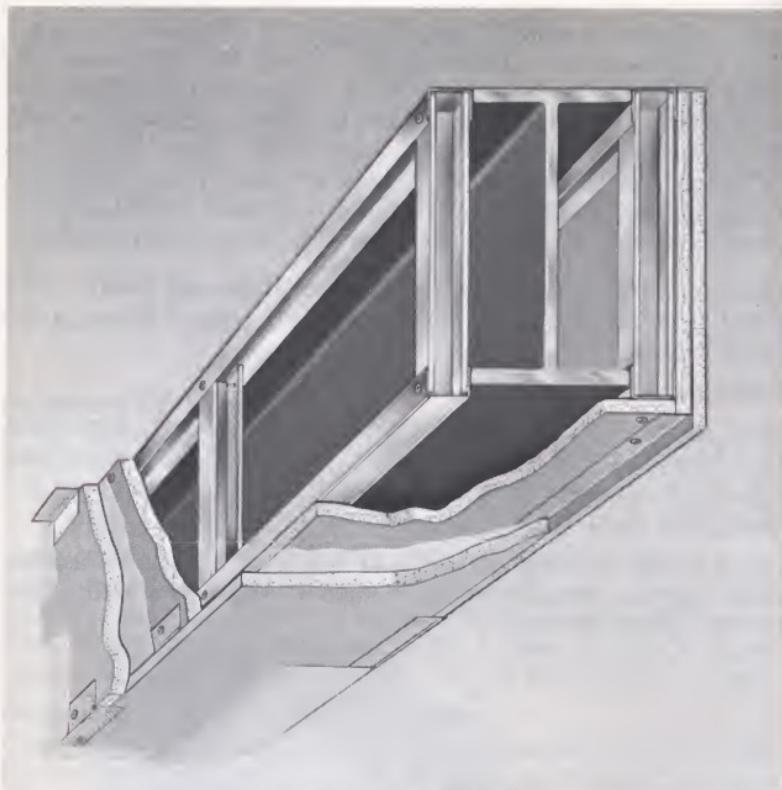
Apply metal trim and corner bead and treat all joints, fastener heads and trim as directed in Chapter 3. Apply reinforcing tape the full length of joint.



Resilient Channel Furring

The RC-1 Resilient Channel provides a low cost and effective means of furring exterior walls in wood frame construction. Because of the resiliency in the channel, the transfer of structural stresses to the interior wallboard surface is reduced.

With Insulating (foil back) SHEETROCK Wallboard applied with the foil against the channels the system provides an effective vapor barrier and significant insulating value. Where there is a possibility of water penetration through the exterior walls, an asphalt felt protection strip should be installed between resilient channel and wall. For further details and installation procedure, see the Resilient Channel Partition System described earlier in this Chapter.



Caged Beam Construction

USG Caged Beam Construction consists of a laminated double layer of $\frac{5}{8}$ " SHEETROCK FIRECODE Wallboard applied to a framework of USG Metal Studs and Runners paralleling the beam. It is a lightweight, fast and economical method of housing beams with a highly decorable surface, by using the same components found in metal stud drywall construction.

MATERIALS

1. **USG Metal Studs**—DWS-158, -212, -358.
2. **USG Runner**—DWR-158, -212, -358.
3. **Gypsum Board**— $\frac{5}{8}$ " thick, 4' wide Tapered Edge SHEETROCK FIRECODE Wallboard—lengths as required.
4. **Fasteners**—USG Drywall Screws, 1" and $1\frac{5}{8}$ " Type S.
5. **Adhesive**—USG Laminating Adhesive or PERF-A-TAPE Joint Compound (embedding type).

INSTALLATION

Stud System Erection—Align DWR ceiling runners adjacent to beam and securely fasten with suitable fasteners spaced 24" o.c.

Cut beam height (plus $\frac{1}{2}$ " for clearance) DWS Metal Studs, position 24" o.c. and fasten to ceiling runner with $\frac{3}{8}$ " Type S-12 pan head screws. Position bottom runner over ends of studs and secure to each stud with a $\frac{3}{8}$ " Type S-12 pan head screw.

Wallboard Erection

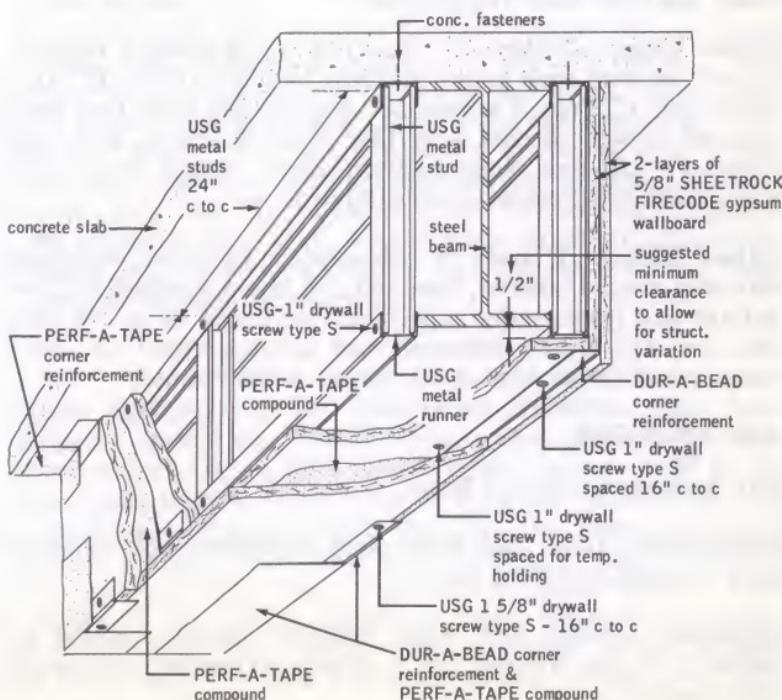
Base Layer—Install base layer panels to beam soffits and attach to runners with 1" Type S drywall screws 16" o.c. Install vertical panels to runners on beam faces and attach to top and bottom runners with 1" Type S drywall screws spaced 16" o.c.

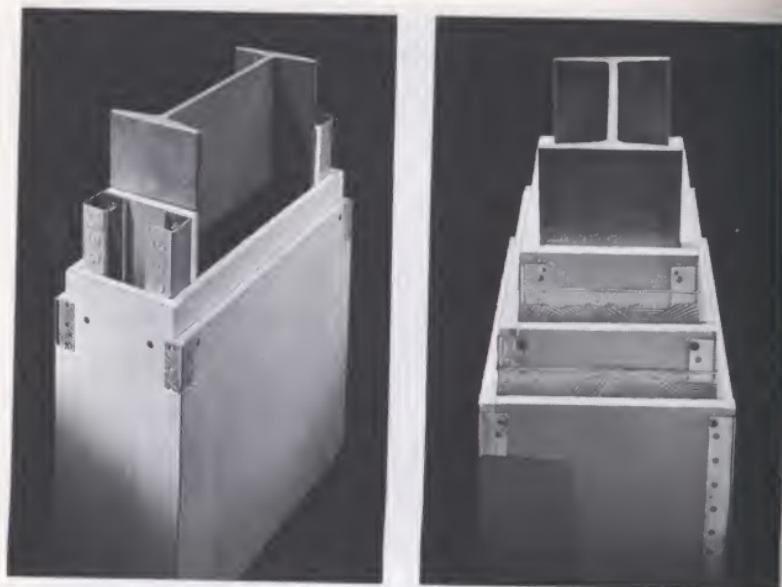
Apply corner bead to bottom outside corners of construction and secure to runners with 1" Type S drywall screws 16" o.c.

Face Layer—Apply adhesive to all base layer surfaces of beam or to back of face panels and laminate face panels using sheet lamination method described in Chapter 3, page 71.

Apply corner bead to bottom outside corners of face layers and securely fasten to internal runners with $1\frac{1}{8}$ " Type S drywall screws 16" o.c.

Finishing Construction—Apply joint treatment over metal trim and to inside corners as directed in Chapter 3.





Column Fire Protection

Steel column fire protection with three layers of SHEETROCK FIRECODE Wallboard offers lightweight, thin, compact fire protection of two or three hours depending upon the construction. The wallboard is held in place by a combination of wire, screws, metal studs and corner bead and PERF-A-TAPE Joint Compound.

FIRE RATED CONSTRUCTION

2-Hour Rating—2 layers $\frac{1}{2}$ " FIRECODE "C" Wallboard vertically around column; base layers attached to USG DWS-158 Metal Studs with 1" Type S screws 24" o.c.; double layer face panel attached to web of stud with $1\frac{1}{8}$ " Type S screws; face layer screws 12" o.c. and staggered from screws in base layer; metal corner bead at all corners; joints finished.

3-Hour Rating—3 layers $\frac{5}{8}$ " SHEETROCK FIRECODE Wallboard vertically around column; base and 2nd layers attached by DUR-A-BEAD and horizontally applied double strand 18 ga. tie wire; 2nd and 3rd layers laminated and screw-attached to corner beads; metal corner bead at all corners; joints finished.

ADVANTAGES

Fire Resistance—up to 3 hours.

Lightweight—These thin lightweight assemblies add minimum dead load and save floor area.

Economy—Quickly and easily installed without waiting for adhesive to dry. Systems use a minimum number of low-cost components.

MATERIALS

1. **Gypsum Board**— $\frac{5}{8}$ " thick, 48" wide Tapered Edge SHEETROCK FIRECODE; $\frac{1}{2}$ " FIRECODE "C" Wallboard—lengths as required.
2. **Adhesive**—PERF-A-TAPE Joint Compound (embedding type).
3. **Joint Treatment**—PERF-A-TAPE or DURABOND Joint System.
4. **Fasteners**—USG Drywall Screws—1" Type S, $1\frac{5}{8}$ " Type S.
5. **Corner Bead**—103 DUR-A-BEAD of ECONO Metal Corner Reinforcement.
6. **Tie Wire**—18 ga. Galvanized Tie Wire.

INSTALLATION

2-Hour Rating—Attach $\frac{1}{2}$ " FIRECODE "C" inner layer to DWS-158 Metal Studs with 1" Type S screws spaced 24" o.c. Place assembly with wallboard adjacent to column flange. Erect another wallboard layer vertically around column. Attach base layer panels to studs with 1" Type S drywall screws 24" o.c.; face layer panels 12" o.c. Apply second wallboard layer to web face side of column and attach through first wallboard layer to web of studs with $1\frac{5}{8}$ " Type S screws 12" o.c. and staggered from screws in first layer. Screw-attach ECONO Corner Bead vertically at all corners and finish over trim with PERF-A-Tape Compound as described in Chapter 3.

3-Hour Rating—Erect $\frac{5}{8}$ " SHEETROCK FIRECODE inner layer vertically, apply DUR-A-BEAD reinforcement vertically at each corner and wire-tie in place with a double strand of 18 ga. tie wire around column. Place wires 6" from slab construction and no more than 21" o.c. Apply PERF-A-TAPE Joint Compound adhesive to inner layer and erect wallboard center layer in same manner as inner layer. Fasten DUR-A-BEAD with 1" Type S screws 12" o.c. Apply adhesive to center layer and erect face layer vertically; apply corner bead vertically at all corners and fasten with 1" Type S screws 12" o.c. Finish over trim with PERF-A-TAPE Compound as directed in Chapter 3.

Plan sections

DUR-A-BEAD corner
reinforcement at
all corners

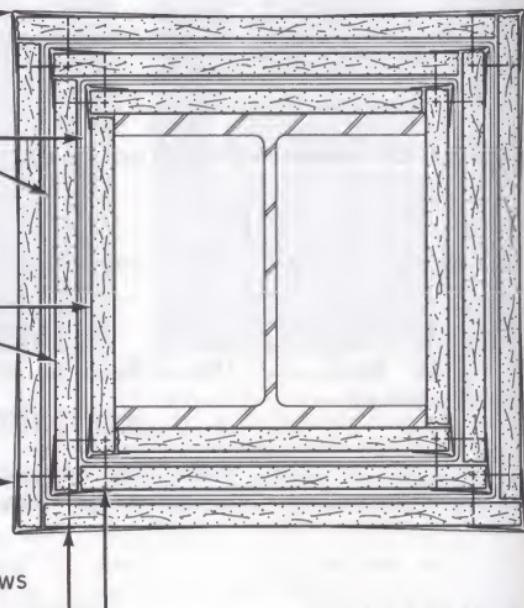
18-ga. tie wire

laminated with
PERF-A-TAPE
compound

flush out corners
with PERF-A-TAPE
compound

1" - USG drywall screws
type - S 12" c-to-c

3-hour



DUR-A-BEAD
corner
reinforcement

PERF-A-TAPE
compound

2-layers
1/2" SHEETROCK
FIRECODE "C"
gypsum wallboard

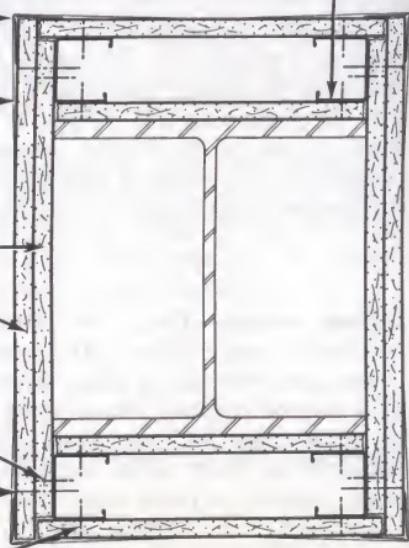
1"-USG
drywall screws
type S 24" o.c.

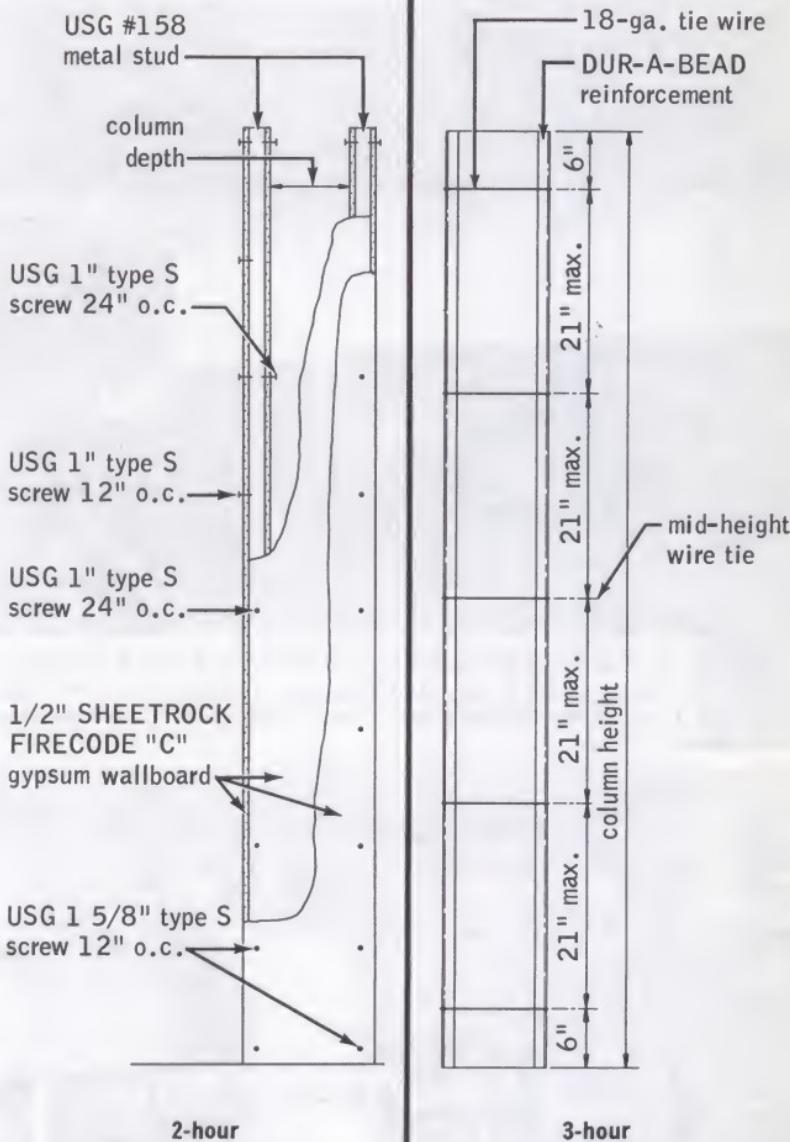
1 5/8" USG
drywall screws
type S 12" o.c.

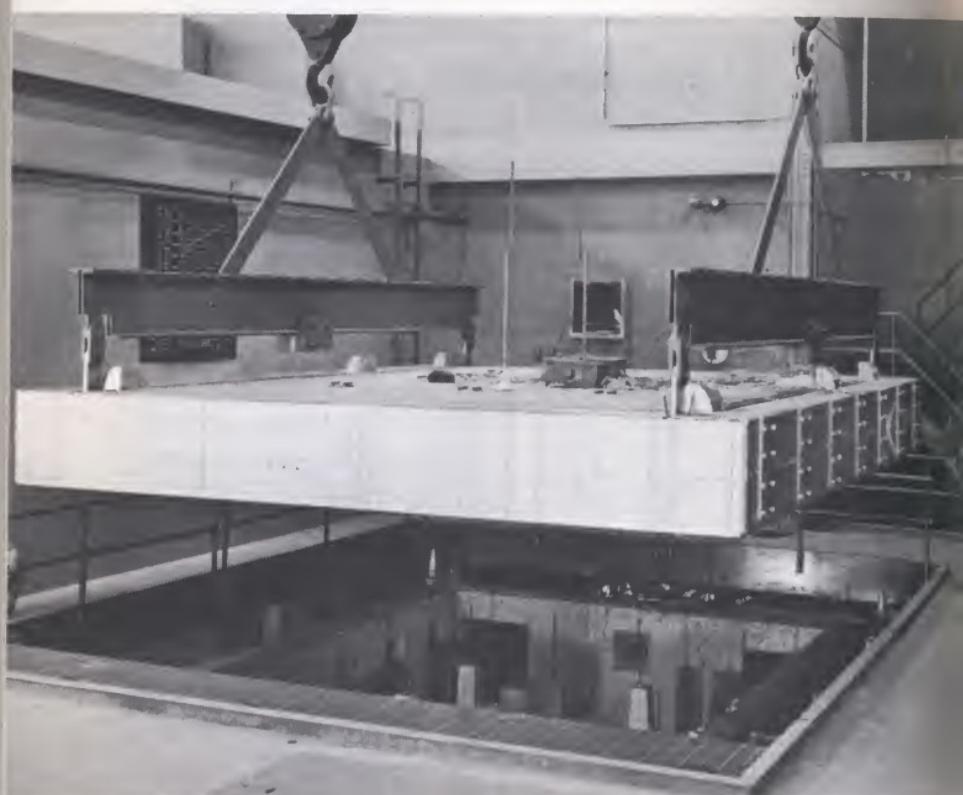
1"-USG
drywall screws
type S 12" o.c.

1 5/8" USG metal stud

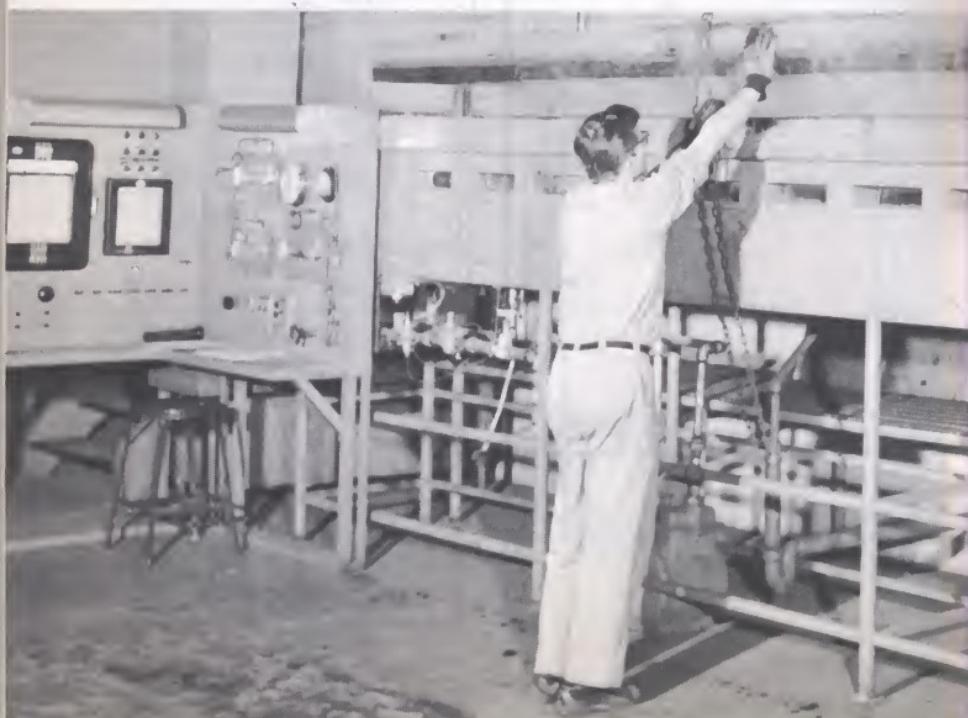
2-hour



Column elevations



Complete concrete floor assembly, with ceiling beneath, (above) is lowered into position for Underwriters' Laboratories, Inc., fire test. A furnace for testing flame spread rating on finished surfaces is shown below.



/FIRE AND SOUND TEST DATA GYPSUM DRYWALL CONSTRUCTION

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CHAPTER

5

Fire and Sound Tests

Laboratory test data are used to compare, specify and select materials and constructions, and frequently to secure code or agency acceptance. Fire and sound ratings are assigned on the basis of performance shown in standard laboratory testing procedures. Laboratory data are often validated by subsequent field tests. Fire and sound ratings are important in evaluating and qualifying gypsum drywall partitions, floor-ceiling assemblies, and column fireproofing enclosures.

A **fire resistance rating** denotes the length of time a given assembly can resist passage of intense heat and flames while supporting the imposed design loads. Fire ratings are correlated with all components of a given assembly—not with the ceiling or partition membrane alone.

The **Sound Transmission Class (STC)** rating has become the most widely accepted means of indicating a partition's sound resistance—the result of comparing the sound transmission loss of a tested assembly with a "standard contour" of known sound loss performance. Where Class ratings are not available, and in the case of ceiling assemblies, "db" (decibel) transmission loss averages are used resulting from sound tests conducted at 9 or 11 frequencies within a range of 125 to 4,000 cycles per second.

Impact Noise Rating (INR) designates the ability of a floor-ceiling construction to resist impact sound transmission. INR is measured on a plus or minus scale in relation to a standard performance curve INR=0. The higher the positive number the better the assembly resists impact sound transmission.

Both fire and sound ratings are based on specific details of assembly which if not followed may directly affect the result. Caulking installed at the perimeter of gypsum wallboard facings and behind runner tracks, for example, is standard practice in all modern sound testing. Any deviation in construction from that described in the test report, therefore, should be checked with the architect prior to beginning of construction.

In comparing any two sets of test data, one must be certain they were obtained under circumstances and by test procedures that were identical or nearly identical. Particularly in the case of acoustical laboratories, test methods are subject to change. This can necessitate the use of a correction factor for tests conducted before or after a certain date.

United States Gypsum leads the industry in documentation of the performance of its drywall systems by recognized testing laboratories—fire ratings ranging up to 2 hours for partitions and ceilings, 3 hours for column fireproofing; STC values as high as 60. In the test listings on the following pages, laboratories are identified at the end of each description as part of the pertinent test references. They are noted by abbreviation as follows:

BMS and NBS—National Bureau of Standards

UL—Underwriters' Laboratories, Inc.

OSU—Ohio State University

U of C—University of California

TL—Riverbank Acoustical Laboratories

G & H—Geiger & Hamme Laboratory

CK—Cedar Knolls Acoustical Laboratories

The Selector Guides below classify tested USG partition assemblies according to their fire and sound ratings and types of construction. The numerals in each column correspond to the "assembly numbers" listed in sequence on the succeeding pages. Rated ceiling assemblies and column fireproofing systems also are included in the tables.

Sound tests have been selected to be as directly comparable to fire tests as possible. In some cases, there may be some slight variations between actual construction used in sound and fire tests. When a question arises, consult the actual test report.

Selector Guide Fire-Rated Partitions

	Wood Stud	Metal Stud	Laminated Gypsum	Movable Gypsum
2 hrs.	1	11, 12, 13, 14, 15, 16	20, 21, 22, 23, 24, 25, 27	
1½ hrs.			26	
1 hr.	2, 3, 4, 5, 6, 7, 8, 9, 10	17, 18, 19	28, 29	30, 32, 33, 34
45 min.				35

Selector Guide Sound-Rated Partitions

	Wood Stud	Metal Stud	Laminated Gypsum	Movable Gypsum
55-60 STC		11, 12	20, 22	
50-54 STC	2, 5, 7	13, 14, 15	21, 27	
45-49 STC	3, 6, 8	16, 17	23	30, 34, 35
40-44 STC	1	18	28	31
UNDER 40 STC	4, 9, 10	19	24, 25, 26, 29	32, 33

See following pages for assemblies numbered as above;
also test data on ceilings and column fireproofing.

Fire and Sound Ratings

WOOD STUD PARTITIONS

Basic Description—2x4 wood studs 16" o.c.— $\frac{5}{8}$ " SHEETROCK FIRECODE gypsum wallboard attached with USG drywall screws—joints finished.

See pages 126 to 137

Assembly No.	Variations & Test References	Fire Rating	STC Rating
1	2 layers each side—base layer att. with 6d c.c. nails—face layer laminated—wt 12 psf—thickn $6\frac{1}{8}$ "—UL Des 4-2 hr (f)—NBS—241 (s)	2 hrs.	40 db (1)
2	2 rows 2 x 3 staggered studs on separate plates 1" apart—2 layers each side—base layer of $\frac{1}{2}$ " USG wood fiber sound deadening board att with 6d c.c. nails—face layer att with 7d c.c. nails—wt 9 psf—thickn $8\frac{1}{2}$ "—UL Des 17-1 hr (f)—USG-46-FT-G & H (s)	1 hr.	53
3	Slotted studs—2 layers each side—base layer of $\frac{1}{2}$ " USG sound deadening board att with 5d c.c. nails—face layer att with 6d c.c. nails—wt. 8 psf—thickn $5\frac{1}{8}$ "—USG-44-FT-G & H (s)	1 hr. (est)	49
4	2 layers each side—base layer of $\frac{1}{2}$ " USG sound deadening board—att with 5d c.c. nails—face layer att with 6d c.c. nails—wt 8 psf—thickn $5\frac{1}{8}$ "—USG-43-FT-G & H (s)	1 hr. (est)	36
5	3" THERMAFIBER ins wool batts between studs—RC-1 channels 24" o.c. att to one side—wt 7 psf—thickn $5\frac{3}{8}$ "—USG-33-FT-G & H (s)	1 hr. (est)	52
6	Without wool—RC-1 channels 24" o.c. att to both sides—wt 7 psf—thickn $5\frac{1}{8}$ "—T-1396-OSU (f)—TL-60-52 (s)	1 hr.	45
7	2 rows 2 x 3 staggered studs on separate plates 1" apart—2" THERMAFIBER ins wool batts between studs one side—wt 8 psf—thickn $7\frac{1}{2}$ "—USG-106-FT-G & H(s)	1 hr. (est)	51
8	Slotted studs—3" THERMAFIBER ins wool batts between studs—wt 7 psf—thickn $4\frac{7}{8}$ "—USG-29-FT-G & H (s)	1 hr. (est)	48
9	2" THERMAFIBER ins. wool batts between studs—wt 7 psf—thickn $4\frac{7}{8}$ "—USG-105-FT-G & H (s)	1 hr. (est)	35
10	Wallboard nailed with $1\frac{1}{8}$ " c.c. nails—wt 7 psf—thickn $4\frac{7}{8}$ "—UL Des 5-1 hr (f)—USG-30-FT-G & H (s)	1 hr.	34

METAL STUD PARTITIONS

Basic Description—DWS-358 metal studs 24" o.c. in runner tracks—2 layers 5/8" SHEETROCK FIRECODE gypsum wallboard each side—face layer laminated and base layer attached with USG drywall screws—joints finished.

See pages 138 to 154

Assembly No.	Variations & Test References	Fire Rating	STC Rating
11	1½" THERMAFIBER sound atten batts between studs—Type G screws, bypassing studs, used to supplement adhesive—wt. 12 psf—thickn 6⅛"—USG-109-FT-G & H (s)	2 hrs. (est)	55(2) 53
12	DWS-212 studs—2 layers ½" SHEETROCK FIRECODE wallboard each side—1½" THERMAFIBER sound atten batts between studs—Type G screws, bypassing studs, used to supplement adhesive—wt 9 psf—thickn—4½"—USG-114-FT-G & H (s)	2 hrs. (est)	54
13	Base layer of ½" USG mineral fiber sound deadening board—face layer laminated & screw att—wt 8 psf—thickn 5⅜"—USG-103-FT-G & H (s)	2 hrs. (est)	52 50(2)
14	3" THERMAFIBER ins wool batts between studs—RC-1 channels 24" o.c. on one side between 2 wallboard layers—face layer on side opposite RC-1 channel laminated—wt 12 psf—thickn 6⅔"—TL-62-212 (s)	2 hrs. (est)	51
15	RC-1 channels 24" o.c. on one side between 2 wallboard layers—all layers screw att—wt 12 psf—thickn 6⅔"—TL-62-180 (s)	2 hrs. (est)	50
16	Basic assembly without wool, sound deadening board or RC-1 channels—wt 12 psf—thickn 6⅛"—UL Des 11-2 hr (f)—TL 60-113 (s)	2 hrs.	46
17	DWS-158 studs—face layer of ½" SHEETROCK FIRECODE wallboard—base layer of ½" USG mineral fiber sound deadening board—wt 7 psf—thickn 3⅓"—UL Des 23-1 hr (f)—USG-57-FT-G & H (s)	1 hr.	48
18	Single layer 5/8" SHEETROCK FIRECODE wallboard—wt 6 psf—thickn 4⅓"—T-1174-OSU (f)—USG-17-FT-G & H (s)	1 hr.	42
19	DWS-158 studs—single layer 5/8" SHEETROCK FIRECODE wallboard—wt 5 psf—thickn 2⅓"—U of C 7-31-62 (f)—TL-64-29 (s)	1 hr.	38

LAMINATED GYPSUM PARTITIONS

Basic Description— $\frac{5}{8}$ " SHEETROCK FIRECODE gypsum wallboard laminated & screw attached to both sides of 1" USG gypsum coreboard—metal runners—joints finished.

See pages 155 to 186

Assembly No.	Variations & Test References	Fire Rating	STC Rating
20	Triple Solid—3 rows coreboard spaced $1\frac{1}{8}$ " apart— $\frac{1}{2}$ " SHEETROCK wallboard facings laminated to outer rows— $1\frac{1}{2}$ " THERMAFIBER sound atten batts in one cavity—wt 17 psf—thickn $6\frac{1}{4}$ "—USG-94-FT-G & H (s)	2 hrs. (est)	59
21	Triple Solid—same as No. 20 without wool—wt 17 psf—thickn $6\frac{1}{4}$ "—USG-95-FT-G & H (s)	2 hrs. (est)	53
22	Double Solid—2 rows coreboard spaced 3" apart— $\frac{1}{2}$ " SHEETROCK wallboard facings both sides— $1\frac{1}{2}$ " THERMAFIBER sound atten batts in partition cavity—wt 13 psf—thickn 6"—USG-96-FT-G & H (s)	2 hrs. (est)	60 56(2)
23	Double Solid—same as No. 22 except rows spaced $1\frac{1}{8}$ " apart and without wool—wt 13 psf—thickn $4\frac{1}{8}$ "—T-1310-OSU-(f)—USG-13FT-G & H (s)	2 hrs.	46
24	Solid— $\frac{1}{2}$ " SHEETROCK FIRECODE wallboard facings—wt 8 psf—thickn 2"—T-1339-OSU (f)	2 hrs.	34 (est)
25	Solid—angle runners at quarter points—joints unfinished—wt 10 psf—thickn $2\frac{1}{4}$ "—UL Des 21-2 hr (f)	2 hrs.	34 (est)
26	Solid— $\frac{1}{2}$ " SHEETROCK wallboard facings—wt 8 psf—thickn 2"—T-1175-OSU (f)	$1\frac{1}{2}$ hrs.	34 (est)
27	418 Ribwall—facings laminated & screw att to staggered 1" x 6" gypsum ribs 24" o.c.—wt 12 psf—thickn $4\frac{1}{8}$ "—UL Des 17-2 hr (f)—TL-63-15 (s)	2 hrs.	51
28	368 Ribwall—facings laminated & screw att to staggered $1\frac{5}{8}$ " x 6" gypsum ribs 24" o.c.—wt 8 psf—thickn $3\frac{3}{4}$ "—TL-62-285 (s)	1 hr. (est)	43
29	278 Studwall—facings laminated & screw att to staggered $1\frac{5}{8}$ " x 6" gypsum studs 24" o.c.—wt 7 psf—thickn $2\frac{1}{8}$ "—UL Des 16-1 hr (f)	1 hr.	36 (est)

MOVABLE PARTITIONS

See pages 187 to 205

Assembly No.	Construction & Test References	Fire Rating	STC Rating
30	USG Demountable Partition— $\frac{1}{2}$ " vinyl faced SHEETROCK FIRECODE wallboard screw att to DWS-212 metal studs 24" o.c.—2" THERMAFIBER sound atten batts between studs—aluminum battens over joints—wt 6 psf—thickn $3\frac{1}{2}$ "—UL Des 21-1 hr (f)—TL-63-127 (s)	1 hr.	49
31	USG Demountable Partition—same as No. 30 without wool—wt $5\frac{1}{2}$ psf—thickn $3\frac{1}{2}$ "—TL-63-126 (s)	—	42
32	VAUGHAN WALLS—standard wall—solid gypsum—special $\frac{5}{8}$ " wallboard laminated to both sides of special 1" gypsum core units 24" wide—V-joints unfinished—wt 10 psf—thickn $2\frac{1}{4}$ "—T-1235-OSU (f)—TL-64-213 (s)	1 hr.	36
33	VAUGHAN WALLS—chase wall—special $\frac{5}{8}$ " wallboard laminated to both sides of special 1" semi-solid gypsum core units—V-joints unfinished—wt 8 psf—thickn $2\frac{1}{4}$ "—UL Des 22-1 hr (f)—TL-64-212 (s)	1 hr.	36
34	VAUGHAN WALLS—sound wall—two rows of semi-solid units spaced $1\frac{3}{8}$ " apart—each row has special $\frac{5}{8}$ " wallboard laminated to both sides of special $\frac{5}{8}$ " semi-solid core units—V-joints unfinished—wt 15 psf—thickn $5\frac{1}{8}$ "—TL-64-189 (s)	1 hr. (est)	45
35	E-Z Wall Partition—special $\frac{3}{4}$ " gypsum panels 24" wide screw att to special metal H-studs 24" o.c.—2" THERMAFIBER sound atten batts between studs—V-joints unfinished—wt $6\frac{1}{2}$ psf—thickn $3\frac{3}{8}$ "—UL Des 6-45 (f)—USG-93-FT-G & H (s)	45 min.	45

BAR JOIST CEILINGS

Basic Description—SHEETROCK FIRECODE gypsum wallboard screw attached to DWC metal furring channels 24" o.c. attached to steel bar joists—joints unfinished.

See pages 212 to 216

Assembly No.	Variations & Test References	Fire Rating
36	$\frac{5}{8}$ " FIRECODE "C" wallboard—UL Des 82-3 hr (f) (Beam 3 hr)	3 hrs.
37	$\frac{1}{2}$ " FIRECODE "C" wallboard—UL Des 221-2 hr (f)	2 hrs.
38	$\frac{5}{8}$ " FIRECODE "B" wallboard—UL Des 63-2 hr (f)	2 hrs.
39	$\frac{5}{8}$ " FIRECODE wallboard—joints finished—UL Des 4-1 $\frac{1}{2}$ hr (f)	1 $\frac{1}{2}$ hrs.

WOOD JOIST CEILINGS

Basic Description—SHEETROCK FIRECODE gypsum wallboard nailed direct to 2x10 wood joists 16" o.c.—1" nom. wood sub and finished floor construction—joints finished.

See pages 206 to 211

Assembly No.	Variations & Test References	Fire Rating	STC Rating	INR Rating
40	½" FIRECODE "C" wallboard—UL Des 42-1 hr (f)	1 hr.	—	—
41	½" FIRECODE "C" wallboard screw att 12" o.c. to RC-1 resilient channels spaced 24" o.c. on joists—UL Des 41-1 hr (f)	1 hr.	—	—
42	Same as 40 except ⅝" FIRECODE wallboard used—UL Des 1-1 hr (f) —CK 6412-7 (s)	1 hr.	37	-19
43	Same as 42 plus carpet and pad atop flooring—CK 6412-8 (s)	1 hr. (est)	38	+5
44	Same as 40 with 3" THERMAFIBER ins batts in joist space—CK 6412-6 (s)	1 hr. (est)	40	-18
45	Same as 44 plus carpet and pad atop flooring—CK 6412-5 (s)	1 hr. (est)	39	+7
46	Same as 41 except ⅝" FIRECODE wallboard used with RC-1 channels —CK 6412-10 (s)	1 hr. (est)	47	-12
47	Same as 46 except ½" FIRECODE "C" wallboard used—CK 6512-6 (s)	1 hr. (est)	47	-12
48	Same as 46 plus carpet and pad atop flooring—CK 6412-9 (s)	1 hr. (est)	47	+15
49	Same as 48 except ½" FIRECODE "C" wallboard used—CK 6512-7 (s)	1 hr. (est)	46	+16
50	Same as 46 with 3" THERMAFIBER ins batts in joist space—CK 6412-3 (s)	1 hr. (est)	49	-5
51	Same as 50 except ½" FIRECODE "C" wallboard used—CK 6512-9 (s)	1 hr. (est)	50	-5
52	Same as 50 plus carpet and pad atop flooring—CK 6412-4 (s)	1 hr. (est)	50	+19
53	Same as 52 except ½" FIRECODE "C" wallboard used—CK 6512-8 (s)	1 hr. (est)	50	+20
54	Same as 40 except ½" FIRECODE wallboard used—UL Des 1-45 min (f)—NBS-716 (s)	45 min.	40 db (3)	—

STEEL COLUMN FIREPROOFING

Basic Description—3 layers $\frac{5}{8}$ " SHEETROCK FIRECODE gypsum wallboard cut to fit against and enclose steel column—outside layer protected by DUR-A-BEAD corner reinforcement screw attached 12" o.c.—finished with PERF-A-TAPE compound.

See pages 229 to 231

Assembly No.	Variations & Test References	Fire Rating
55	1st & 2nd layers wire-tied in place—2nd and 3rd layers laminated, corner reinforced & screw att at corners—UL Des 14-3 hr (f)	3 hrs.
56	2 layers $\frac{1}{2}$ " FIRECODE "C" wallboard screw att to DWS-158 metal studs—ECONO metal corner reinforcement screw att over outside layer—UL Des 10-2 hr (f)	2 hrs.

NOTES: (1) 9-frequency average. (2) Job test results. (3) 11-frequency average.

ABBREVIATIONS: STC—Sound Transmission Class; INR—Impact Noise Rating; att—attached; psf—pounds per sq. ft.; wt—weight; thickn—thickness; ins—insulating; attenu—attenuation; Des—Design; db—decibel; f—fire; s—sound



Intricate framing around heating and air conditioning plenum conceals duct, conserves light from high windows, provides attachment for light fixtures. Framing of drywall furring channel was partially cut for bending to proper angle. A complete understanding of job details plus proper inspection (right) can create trouble-free functional structures of architectural beauty.



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CHAPTER

6

Problems: Their Cause, Remedy or Prevention

It is to your advantage to know and understand the conditions which may adversely affect quality of the finished wallboard job.

Almost invariably, unsatisfactory results show up first in the areas over joints or nail heads. Improper application of either the board or joint treatment *may* be at fault, but other conditions existing on the job can be equally responsible for reducing the quality of the finished drywall application.

Irregularities found over joints, for example, usually occur in a straight line pattern. These can be caused by joint ridging, starved joints, joints located over twisted studs or on high studs or joists, board edges out of plane, joints over which delayed shrinkage has occurred, or any combination of these.

Compounds used for joint finishing are a "drying type" material and therefore harden as the contained water is evaporated. As they dry, their volume shrinks. Normal shrinkage offers no problem and is anticipated in proper application procedure (see Chapter 3). Excessive shrinkage, which can be a source of trouble, may be found to result from poor atmospheric or job conditions as well as from application abuses.

This is one of the more frequently encountered field problems covered in the tables following in this chapter. Each problem is listed in alphabetical order according to location, with the probable cause and recommended remedy or prevention. Following the tables are discussions of wood shrinkage and its effect on nail popping, precautions necessary in partitions for high-rise buildings, and drywall job inspection procedures.

In the tables the condition, or problem, is listed across the top of each item; under "remedy", methods of prevention also are included when applicable.

BOARD—Burried Ends

Cause: Ends of boards become roughed up and can be felt as a ridge along end of board.

Remedy: Sand off burr before erecting board.

BOARD—Improperly Fitted

Cause: Board wedged into place or improperly nailed cannot be brought into natural contact with framing (Fig. 1), or may buckle causing one end or edge to override the other.

Remedy: Remove board, cut to fit properly, and replace. Nail from center of board toward ends and edges. Apply pressure to hold wallboard tightly against framing while nailing.

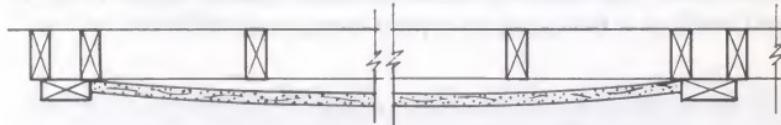


Fig. 1

BOARD—Damaged Edges

Cause: Paper-bound edges have been damaged or abused; may result in ply separation along edge or in loosening of paper from gypsum core. Also may fracture or powder the core itself; edges are more susceptible to ridging when joint system is applied.

Remedy: Avoid butting together damaged edges that may easily be compressed. Handle SHEETROCK Wallboard with reasonable care. Cut back any severely damaged edges to sound board before application.

BOARD—Loosely Nailed

Cause: Framing members are uneven because of minor bowing and warping; lack of pressure on board during nailing; head of nail alone cannot pull wallboard into firm contact with uneven members. Also see BOARD—Improperly Fitted.

Remedy: During final blows of hammer, apply additional pressure with hand to board adjacent to nail (Fig. 2) to bring board into contact with framing.

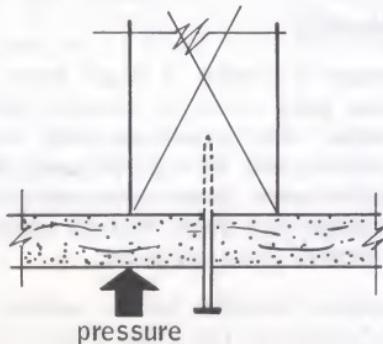


Fig. 2

BOARD—Surface Fractured After Application

Cause: Excessive abuse or heavy blows have fractured finished wall surface—too large a break for repair with joint compound.

Remedy: In shape of equilateral triangle around damaged area, cut out plug of wallboard with keyhole saw, slope edges inward at 45°. Cut corresponding plug from sound wallboard, sand edges to exact fit. If necessary, cement extra slat of wallboard to back of face layer to serve as brace. Butter edges (Fig. 3) and finish as a butt joint with joint compound (Fig. 4).



Fig. 3



Fig. 4

BOARD—Water Damaged

Cause: During transit or storage, water has damaged wallboard; subject to scuffing, may develop paper bond failure. Dissolved glue from bundling tapes may damage board faces and cause them to stick together. If stored wet, may be subject to mildew.

Remedy: Usually will dry and perform satisfactorily; handle board cautiously and re-pile with bundles separated by spacer strips of wallboard. Check incoming board for water stains, protect carefully during shipment and storage. Do not erect damp boards for this may result in paper bond failure.

FINISH—Discoloration

1. Cause: Differences in suction of board paper and joint compound may lighten paint color or change gloss or sheen in higher suction areas; most common when conventional oil paints are used; also caused by over-thinning of paint. Suction differences may also cause greater amounts of texturing material to be deposited over high suction areas causing color differences when viewed from an angle.

Remedy: Seal surface properly before painting and texturing with SHEETROCK Sealer or TEXOLITE Primer-Sealer under oil or water-thinned paints; or TEXOLITE Primer under whites or light pastels.

2. Cause: Joint darkening may occur, most commonly with tinted paint color rather than white. Most severe when painting has been done in humid weather or when joints have not fully dried; also when high or medium alkaline joint compounds have been used.

Remedy: Use only USG joint compounds, formulated with proper alkalinity. Under humid conditions, compounds should dry 48 hours or more between coats. Repaint only after joints are thoroughly dry.

3. Cause: "Nail spots" may appear as dust particles accumulate over nail heads in outside walls and top floor ceilings; due to greater dissipation of heat directly over nail heads. Most severe with great indoor-outdoor temperature variation.

Remedy: Wash painted surfaces, remove spots with wallpaper cleaner, or redecorate surfaces affected; change air filters regularly. **Preventive measures:** Use double layer SHEETROCK Wallboard application, which does not require face layer nailing, thus minimizes nail spotting.

4. Cause: Browning may occur over joints when poor quality polyvinyl acetate based paints have been used, primarily in highly humid weather.

Remedy: Redecorate with a quality USG latex, alkyd flat or texture paint.

5. Cause: Alkali discoloration or "burning" may occur with oil paints tinted with alkali sensitive pigments; appears as color change generally toward red or orange. Caused by diffusion of alkalies from high alkaline joint compounds into paint.

Remedy: Use the PERF-A-TAPE System, free of this danger. Use water-thinned paints, which have alkali-resistant pigments.

6. Cause: Acid discoloration of paint pigments affects oil or water-thinned paints tinted with ultra-marine blue. Caused by reaction to sulphur gases from unvented gas or oil heaters. Color fades out in field of board, leaving bluer appearance over joints.

Remedy: Avoid use of ultra-marine blue tints in paint; vent all heaters and redecorate.

FRAMING—Members Out of Alignment

Cause: Due to misaligned top plate and stud, hammering at points "X" (Fig. 5) as board is applied on both sides of partition will probably result in nail heads puncturing paper or cracking board. Chances of nail pops also are increased if board is applied over such misaligned members. Framing members more than $\frac{1}{4}$ " out of alignment with adjacent members make it difficult to bring board into firm contact with all nailing surfaces.

Remedy: Check alignment of studs, joists and plates before applying board, and correct before proceeding. Straighten badly bowed or crowned members. Shim out flush with adjoining surfaces. Use Adhesive Nail-On method of attachment.

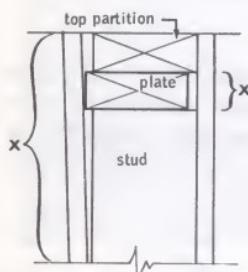


Fig. 5

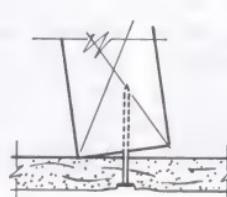


Fig. 6

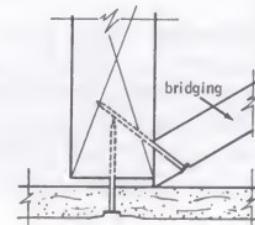


Fig. 7

FRAMING—Members Twisted

Cause: Framing members have not been properly squared with plates, presenting angular nailing surface (Fig. 6). When board is applied, there is danger of puncturing paper with nail heads or of reverse twisting of member as it dries out, with consequent loosening of board and probable nail pops. Warped dimension lumber may contribute to this deformity.

Remedy: Align all twisted framing members before application. Also see Framing Requirements, Chapter 1.

FRAMING—Protrusions

Cause: Bridging, headers, firestops or mechanical lines have been installed improperly so as to project beyond face of framing, preventing board from contacting nailing surface (Fig. 7). Result will be loose board, and nails driven in area of protrusion will probably puncture face paper.

Remedy: Before applying board, check to make certain there are no protrusions beyond plane of nailing surface. See that they are trimmed off or reinstalled.

JOINTS—Blisters in Tape

Cause: Insufficient compound was used under the tape, or tape was not initially pressed into good contact with the compound.

Remedy: Open up blistered area by slitting tape. Fill cut with joint compound and press tape back in place with knife blade. When dry, sand to smooth, level finish.

JOINTS—Cracks in Inside Corners

Cause: Too much compound was applied over tape at apex of angle.

Remedy: Wipe down corners correctly after applying compound, leaving only a small amount or no compound in apex. If cracks still occur, excessive structural movement is the cause.

JOINTS—Edge Cracking

Cause: After completion of joint treatment, straight narrow fissures or cracks may appear along edges of tape. This can result from: too rapid drying because of high temperature accompanied by low humidity, or excessive drafts; improper application, such as overdilution of joint compound, excessive joint compound under tape or failure to follow embedding with a skim coat over tape; cold, wet application conditions which also may cause poor bond.

Remedy: Especially when poor atmospheric conditions exist, carefully examine all joints after taping and skimming applications have dried; repairs are more economical at this stage. Cut away any weakly bonded tape edges. Fill hairline cracks with cut shellac (2 to 3 lbs.); groove out larger cracks with sharp tool, coat with shellac and allow to dry, then refill with joint compound; or cover cracks with complete joint treatment including reinforcing tape, feather to even surface with plane of board: **Preventive measures:** Use **PERF-A-TAPE** Ready-Mixed Joint Compound or **DURABOND** Joint Compound which have maximum built-in resistance to cracks; place shielding devices over room openings to prevent drafts; wet down floors if room humidity is too low; during cold weather, control heat at minimum of 55° and supply good ventilation. Avoid practices listed under "Cause", above.

JOINTS—High Joints or Crowns

Cause: Needless piling of compound in channel; compound not feathered out beyond shoulders; insufficient sanding; framing may be out of alignment or board edges not tight against framing.

Remedy: Sand joints to flush surface. If misaligned framing or board are responsible, see "Framing" or "Board" problems, above.

JOINTS—Ridging or Beading

Cause: Combination of factors may cause joint deformity which appears as a continuous ridge or bead along length of joint, with uniform fine ridge-like pattern at exact center. Usually develops after joint finishing is completed, at any time from a few hours to several months afterward. Occurs on sidewalls with same frequency as on ceilings, but is usually more apparent on ceilings because of large expanse, angle of view, and light conditions. Ridging is *not* a result of a material quality defect; incidence is greater on jobs taped and finished during cold, damp or highly humid periods and on joints finished with high crown and wide feathering rather than with flat, narrow concealment. Severity of ridging will increase under widely fluctuating humidity conditions.

Remedy: (1) Let ridge develop fully before undertaking repairs—usually six months is sufficient. Time repairs for hot and dry conditions. (2) Sand ridge down to reinforcing tape without cutting through tape. Fill concave areas on either side of ridge with light fill of thick mix compound. After this is dry, float very thin film of compound over entire area. (3) Examine area with strong side lighting to make certain that ridge has been concealed. If not, use additional coats of compound. Redecorate.

Preventive measures: Use USG Back-Blocking System or Double Layer adhesive lamination (Chapter 3). Follow general recommendations for joint treatment (Chapter 1) and approved application procedure (Chapter 3). Pay particular attention to temperature, ventilation, consistency of compound, prompt covering coat over tape, minimum width of fill and finish coats, and required drying time between coats.

JOINTS—Excessive Shrinkage

Cause: (1) Atmospheric conditions—slow drying and high humidity; (2) Job conditions—inadequate protection from hot drafts; (3) Insufficient drying time between coats of compound; (4) Excessive water addition in mixing compound; (5) Heavy fills.

Remedy: See "Starved Joints" below.

JOINTS—Starved Joints

Cause: This is a form of delayed shrinkage caused chiefly by insufficient drying time between coats of compound. May also be caused by insufficient compound applied over tape to fill channel, over-thinning of compound, or oversanding. Shrinkage usually progresses until drying is complete.

Remedy: Reapply a full covering coat of heavy-mixed compound over tape—since this is heaviest application, most shrinkage will take place in this coat, making it easier to fill channel properly. Finish by standard procedure.

NAILING—Nail Pops

Cause: A protrusion directly over the head of a nail results from outward movement—of the concealed nailhead in relation to the smooth finished surface of wallboard. This protrusion is usually only slightly larger than the nail head but may be about the size of a hammer dimple and is known as a nail pop. It may occur with any type of material secured to wood with nails. With drywall, it is the product of improper application, lumber shrinkage, or a combination of both. With board held reasonably tight against framing member (Fig. 8 below), only severe shrinkage of the lumber normally will cause nail pops. But if nailed loosely (Fig. 9), any inward pressure on board will push nailhead through its thin covering pad of compound. Likewise, board insecurely nailed (Fig. 10) is subject to movement and vibrations which result in nail pops. Pops resulting from "nail creep" occur when shrinkage of the wood framing exposes nail shank and consequently loosens board (see "Wood Shrinkage" discussion following table).

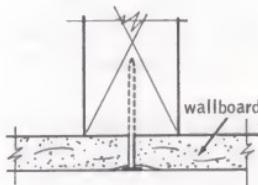


Fig. 8

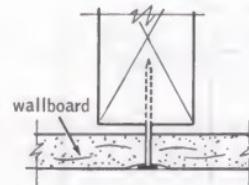


Fig. 9

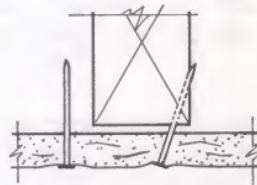


Fig. 10

Remedy: Repairs usually are considered necessary only for pops which protrude .005" or more from face of board. Smaller protrusions may require repair if they occur in a smooth gloss surface or flat painted surface under extreme lighting conditions. Those which appear before or during decoration should be repaired immediately. Pops which occur after one month's heating or more are usually caused wholly or partly by wood shrinkage, and should not be repaired until near end of heating season. Repair procedure is to select proper nail for thickness of board, then drive it about $1\frac{1}{2}$ " from popped nail while applying sufficient pressure adjacent to nailhead to bring board in firm contact with framing. Strike popped nail lightly to seat it below surface of board. Remove loose compound and apply finishing coats of compound and paint. **Preventive measures:** removal of insecure nails and proper nail application; use of lumber meeting Framing Requirements (Chapter 1); attachment with USG Drywall Screws or by Adhesive-Nail on Application (Chapter 3).

NAILING—Puncturing of Face Paper

Cause: Twisted or misaligned framing members, protrusions of bridging, poorly formed nailheads, careless nailing, or excessively dry face paper can bring on puncturing problems. Nailheads which puncture face paper and shatter core of board (Fig. 11) have very little grip on wallboard and often cause nail pops.

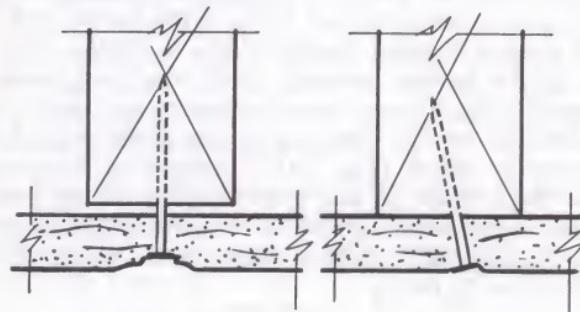


Fig. 11

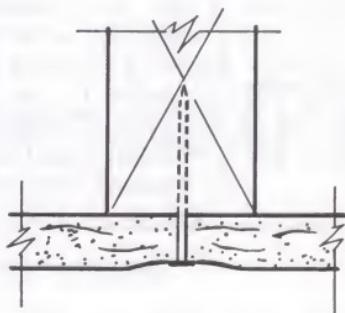


Fig. 12

Remedy: Correction of faulty framing (see Framing problems, above) and properly driven nails produce tight attachment with slight uniform dimple (Fig. 12). Nailhead bears on paper and holds wallboard securely against framing member. Recommended GWB-54 nails have a head designed to minimize cutting; USG Drywall Screws with specially contoured head are best fastener known to eliminate cutting and fracturing. If face paper becomes dry and brittle, its low moisture content may aggravate nail cutting. One remedy is to hang board in position with a few nails, then sponge or fog spray areas in which other nails will be driven. Other methods are to cover stacked board with vapor-proof plastic sheets and place pails of water under sheets, to stock board on concrete slabs, fog spray the framing, or splash water across floors. Otherwise, replacement of nails and filling of depressions in joint compound may be necessary.

Characteristics of Wood Shrinkage

Framing lumber as commonly used has a moisture content in the range of 15% to 19%. However, individual pieces may be considerably higher or slightly lower.

Wood having a moisture content at the time of construction in the 15% to 19% range may, in service, eventually reach a moisture content of from 5% to 10%, except in the damp Southern coastal states and the dry Southwestern states, where the ranges may be 8% to 13% and 4% to 9% respectively. Thus, when wood is framed into a building and the building is put into service, the framing lumber loses some of its moisture content. After the lumber has eventually reached equilibrium with surrounding conditions, there will be only minor residual increases and decreases in its moisture content. *The important fact to be established here is that the first and by far the greatest change in moisture content usually occurs during the first year after construction, particularly during the first heating season.*

Living wood may contain from 30% to 300% of water. This water is divided roughly into two parts—free water in cell cavities and water absorbed by the capillaries of the fibers and ray cells. When all the free water has been removed and the absorbed water remains, the wood is said to have reached the fiber saturation point, which is approximately 30%.

Wood shrinks as the moisture content of the wood is reduced below 30%. *As the moisture content of a piece of wood is reduced below the fiber saturation point, the unit of shrinkage is fairly uniform, being approximately 1/30 of the total shrinkage which may occur for each 1% loss of moisture content.*

Wood shrinks most in the direction of the growth rings (flat grain) somewhat less across the growth rings (edge grain) and very little, as a rule, along the grain (longitudinally). Generally, heavier pieces of the same wood species shrink more than the lighter ones. (These characteristics often account for a concentration of nail pops along the length of a particular stud or joist.)

Under job conditions, the gypsum wallboard is usually applied within two to four weeks after the building has been enclosed. During this period the framing will dry out to a certain extent, depending upon drying conditions. *However, even under the most favorable drying conditions and four weeks' exposure, it is doubtful that the moisture content of the framing will reach a percentage as low as that which will occur "in service."*

(The authority for the preceding is U.S. Department of Agriculture publication, Wood Handbook No. 72, in a section titled "Control of Moisture Content and Shrinkage of Wood." Obtainable from Supt. of Documents, U.S. Government Printing Office, Washington 25, D.C.)

Each increment or part of a mass of wood shrinks at a fairly uniform rate. Shrinkage in a mass of wood is toward the center. The movement of any point on the wood or boundary, such as an outer surface towards the center, is equal to the total of the shrinkage of each increment between that point or boundary and the center.

For example, Fig. 13 shows a mass of wood 4" wide by 2" thick divided into 1" increments. For purposes of illustration, a total of $1/16$ " shrinkage has been selected for each 1" increment under conditions wherein the moisture content has been reduced from 19% to 10%. The outer plane of Areas "A" has moved $1/16$ " closer to the horizontal center line. The outer surface of Areas "B" has moved $1/8$ " closer to the horizontal center line ($1/16$ " for the shrinkage in Areas "A" plus $1/16$ " for the shrinkage in Areas "B"). Similar proportionate shrinkage also occurs in relationship to the vertical center line.

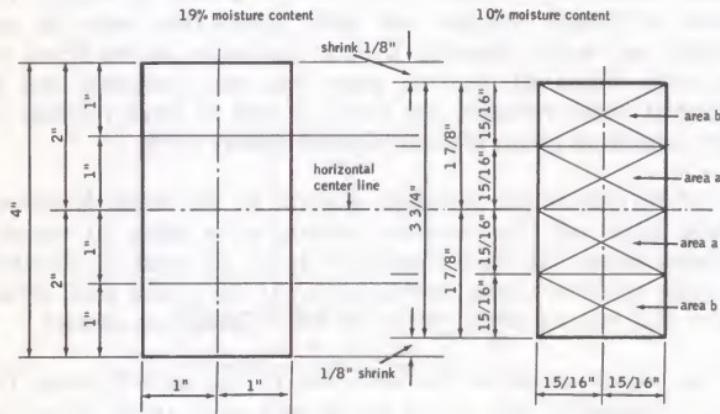


Fig. 13

Effect of Wood Shrinkage on Nails

Fig. 14 represents the cross section of a piece of framing lumber with a moisture content of 19% through which has been driven a steel rod with both ends sheared off flush with the surface. The right hand drawing represents the same piece of wood after the moisture content has been reduced to 10%. Note that wood shrinkage has resulted in a movement of each outer edge surface of the wood $1/8$ " towards the center line; also, that the steel rod protrudes from the lumber on each edge $1/8$ ".

NOTE: The dimensions used in Figures 15 to 17 inclusive were selected only for convenience to illustrate principles and *are not to be construed as actual measurements*.

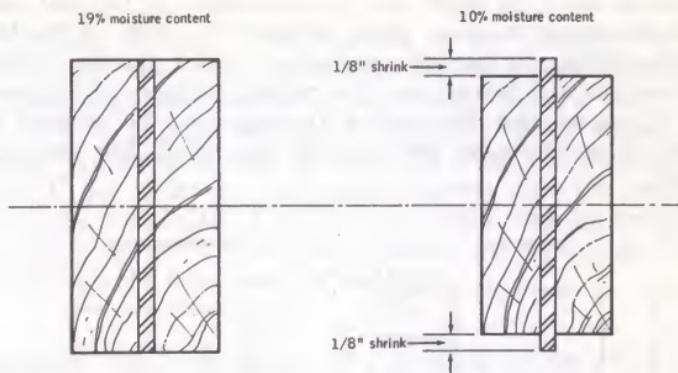


Fig. 14

Fig. 15 illustrates the same conditions as in Fig. 14 except that nails have been driven different distances into the 19% moisture content wood, one nail penetrating 2" and the other 1". The sections of the nails protruding from the wood were then sheared off flush with the surface as illustrated by the drawing on the left.

In the drawing on the right, the wood penetrated by the 2" section of the nail shrank $\frac{1}{8}$ ", resulting in an exposure of $\frac{1}{8}$ " of the nail shank. In this same drawing, note that the wood penetrated by the 1" nail shrank $\frac{1}{16}$ ", resulting in an exposure of the nail shank of only $\frac{1}{16}$ ". The $\frac{1}{16}$ " shrinkage of the wood between the point of the 1" nail and the center line resulted in the nail's moving $\frac{1}{16}$ " toward the center line.

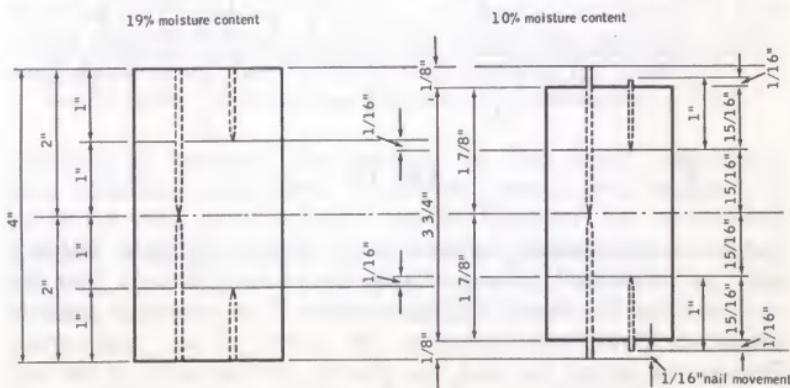


Fig. 15

Figures 16 and 17 illustrate $\frac{1}{2}$ " gypsum wallboard attached with nails having a penetration of 2" and 1" respectively. The figures on the right show how the emergence of the nail due to wood shrinkage creates a space between the back of the board and the nailing surface. A comparison of the distances between the backs of the boards and the nailing surfaces of Figures 16 and 17 shows that the use of the *shorter nail* resulted in a *smaller* space between the back of the board and the nailing surface.

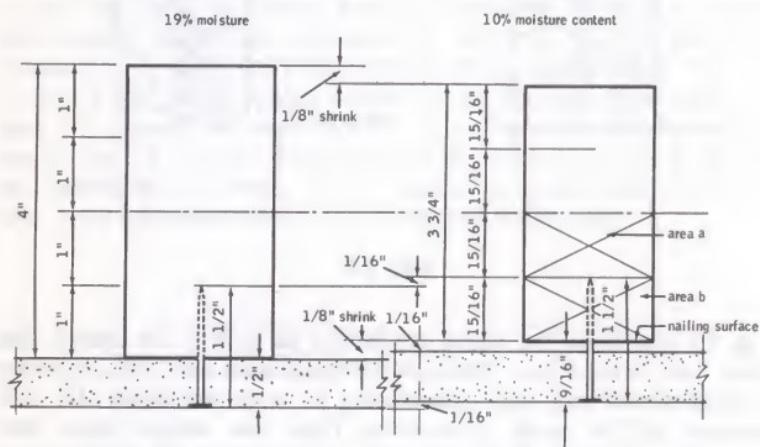


Fig. 16

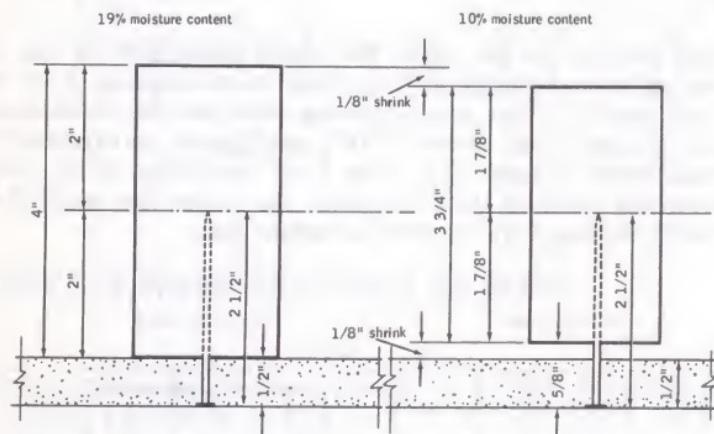


Fig. 17

Extensive experiments conducted by Forest Products Laboratory and Purdue University have shown conclusively that the recession of the wood nailing surface from the nail head is almost in direct proportion to the depth of the penetration. That is, the longer the nail, the greater the exposure of the nail shank; the shorter the nail, the less the exposure of the nail shank.

Nail Pops Due to Wood Shrinkage

As previously shown, as the framing lumber shrinks, the distance between the head of the nail and the nailing surface of the framing member increases. Assuming that the nail originally held the gypsum wallboard reasonably secure against the framing, the board is held less securely after the framing has shrunk. If the additional nail shank exposure is in the range of $1/16"$ (.0625) to $1/32"$ (.03125) the board will no longer be held tightly against the framing. This is the condition (loose nail) which is the basic cause of nail pops.

Fortunately, minor emergence of a properly driven nail (up to $.005"$) seldom results in a visible pop. Were it not for this, nail pops due to lumber shrinkage would be much more common.

If framing lumber has been subjected to a full heating season, chances are good that the lumber has reached an equilibrium moisture content. During the following spring, summer, and fall seasons, the lumber will undoubtedly pick up some moisture and swell to a degree. During the following winter, heating will again result in a loss of moisture content and subsequent shrinkage. Although there is little factual data on what actually occurs, it is believed seasonal fluctuations are usually in the range of not more than 2% to 4% moisture content differences. Under these conditions, movement is so slight that there is little danger of future pops.

Cracking Problems in High-Rise Structures

Drywall contractors who install commercial partitions should be aware of the cracking problems that have recently been identified in high-rise buildings employing "flat plate" reinforced concrete construction. In this design the underside of the concrete structural floor slab becomes the base for a ceiling.

Cracking of partitions has occurred in "flat plate" buildings—most seriously in the upper floors—in various parts of the U.S. Extensive research by United States Gypsum has established that this cracking occurs in two distinct patterns traced to two different probable causes associated with the design of the building. *Neither can be attributed to faulty materials.*

One pattern, known as Type A, usually occurs in the form of cracks and gaps at opposite corners of partitions which connect

an exterior and interior column (Fig. 18). Diagonal cracks may also show up on the face of the partition if the edges are unusually well reinforced.

This type of partition failure, found primarily in buildings where exterior columns are exposed, results from racking of structural elements that surround and support the partition. The racking is believed due to movement of exterior columns and beams as outside temperatures change. The cracking may still occur, but is less severe when the partitions are supported by a suspension system.

On the basis of research and job experience, two factors can be estimated—the “*critical height*” above which Type A cracking may occur in flat plate buildings of various heights; and the *amount* of slab deflection, resulting from column movement, that may be expected in those buildings in various climatic areas of the U.S.

Both factors are shown in the table below. The amounts of anticipated deflection are given for four different temperature ranges based on low average winter temperatures (+20° to -20°F.). The movement for all four ranges is calculated from a 70° average. It is assumed that upward movement from summer temperatures and sun load will be no greater than the downward deflection in winter.

Height of Building	Critical Height	Calculated Amount of Slab Deflection			
		70° to +20°	70° to 0°	70° to -10°	70° to -20°
10 floors—95'	6th floor	.106"	.156"	.180"	.200"
15 floors—140'	8th floor	.160"	.230"	.260"	.295"
20 floors—185'	10th floor	.220"	.305"	.350"	.390"
25 floors—230'	12th floor	.270"	.378"	.430"	.485"
30 floors—275'	14th floor	.320"	.450"	.520"	.585"
35 floors—320'	16th floor	.375"	.525"	.600"	.675"
40 floors—365'	18th floor	.430"	.600"	.680"	.765"

The second pattern of cracking, identified as Type B, is predominately found near the center of a partition span (Fig. 19). It is believed to be the result of flexural tension as the wall panel tries to follow the deflection of the flat plate floor and/or ceiling. Flexural cracks are widest at the bottom, and run out as they move vertically up the partition. They are typically much narrower than Type A cracks and may be expected anywhere in the building, not just on the upper floors. They are less likely to occur when the wall connects to a suspended ceiling than when it extends to the bottom of the structural floor.

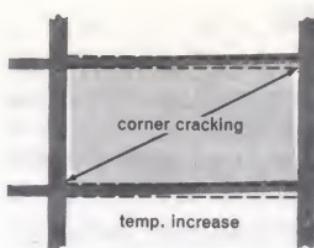


Fig. 18—Type A

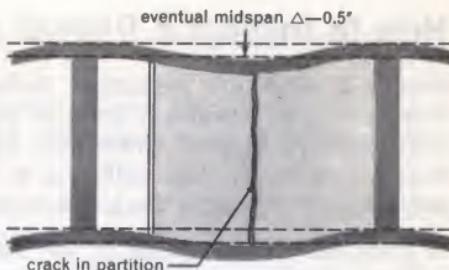


Fig. 19—Type B

Not only is Type B cracking less severe than Type A, but the probable amount of deflection in the flat plate—responsible for its occurrence—can be calculated by the structural engineer in advance with reasonable accuracy.

The question of “What can be done about it?” has at least four prospective answers:

1. After the cracking has occurred, repairs can be undertaken—but they are likely to be successful only in the case of Type B cracking. Since the basic deflection gradually decreases, Type B cracks can be filled satisfactorily after about one year. On the other hand, Type A cracking cannot be repaired by filling the cracks, since the racking distress reverses with a change in seasons. A corner that is now being pulled apart will show signs of compression six months later.
2. In design of the building, anticipated structural movement in the frame and deflection in the floor system should be taken into account. Preliminary investigation indicates that exposed concrete columns and shear walls can be safely used in structures from six to ten stories high in most areas.
3. For the critical upper floors of a taller flat plate building (see table, above), the architect should select, or the contractor should suggest, partition and ceiling systems that have sufficient resistance to the stresses causing Type A cracks.
4. Control or “slip” joints should be provided at the periphery of walls installed on critical floors. Such joints minimize the effect of both structural movement and flat-plate deflection.

It is clear that problems of partition cracking with flat plate construction are best met by preventive measures before installation, rather than by attempted repairs afterward. Meanwhile, United States Gypsum is making intensive efforts to develop partition walls that can accommodate the building movements, rather than resist them—and still maintain past economies.

How to Inspect a Drywall Job

Proper drywall job inspection during installation many times reveals potential problem areas or procedures that will produce unsatisfactory results. Corrective action taken immediately is usually less costly than callbacks to repair and perhaps rebuild walls and ceilings after the job is completed.

A complete understanding of job details, schedules, and specifications is necessary to conduct proper inspection. If the assembly is to meet fire and sound rating requirements, then construction details must also be known. All walls and ceilings must be judged by these criteria and the awarded contract. Thus it is important that drawings and specifications be complete, accurate and easily understood.

The following discussion is aimed at preventing trouble before it starts. Proper planning and attention to printed instructions will many times eliminate the need to refer to earlier parts of this chapter. A better, high quality drywall job will be produced with a minimum of effort and unprofitable extra cost.

SCHEDULE OF INSPECTION

Make job inspections at the following stages:

- A. When drywall materials are shipped to the job, (1) verify material meets specifications and approvals, (2) check for proper storage of materials (see Chapter 1). Damaged material should not be used.
- B. When framing is erected but before wallboard application.
- C. When base layer is applied; when face layer is applied.
- D. When joints are treated, (1) during taping and first coat application, and (2) during second coat application.
- E. When job is completed.

INSTALLATION INSPECTION

Job inspection should include the installation of *all* materials with particular attention directed to the following items:

Framing

1. Check accuracy of alignment and position of framing according to plans or details.
2. See that partitions are straight and true; ceilings level.
3. Measure spacing of studs and joists. Spacing should not exceed maximum allowable for the system.
4. Verify that there is caulking beneath runners, if required.
5. Look for protrusions of blocking, bridging, or piping, and twisted studs and joists that would create an uneven surface. Correct situation before wallboard attachment.

6. Make sure there is appropriate blocking and support for fixtures and wallboard.
7. Measure the moisture content of wood framing with a moisture meter. Delay wallboard application until moisture content is 15% or less.
8. Check to see that window and door frames, electrical and plumbing fixtures are set for the wallboard thickness used.
9. Check for proper position and attachment method of RC-1 Resilient Channels.
10. Review all wood framing for compliance with minimum framing requirements outlined in Chapter 1.
11. Examine metal studs at corners, intersections, terminals, door and borrowed light frames for positive attachment to floor and ceiling runners.
12. Inspect spliced metal studs for proper assembly.
13. See that door and borrowed light frames are securely attached to stud and runner rough framing at all anchor clips.
14. Look for spot grouting at door and borrowed light frames.

Suspended Grillage

1. Measure spacing of hangers, channels and studs to see that they are within allowable limits.
2. Check ends of main runner and furring channels. They should not be let into or supported by abutting walls, and should extend to within 6" of the wall to support a furring channel.
3. Make sure DWC furring channel clips are alternated and that furring channel splices are properly made.
4. See that mechanical equipment is independently supported and does not depend upon the grillage for support.
5. Inspect construction around light fixtures and openings to see that recommended reinforced channel support is provided.

Base Layer

1. Verify that material being used complies with the specifications and fire or sound test construction.
2. Make sure the proper type of application is being used, horizontal or vertical application, and that joints are staggered.
3. Check for cracked and damaged edge board. These should not be used.
4. See that the recommended fastener is being used and measure the spacing of fasteners.
5. Check caulking for proper seal behind electrical boxes, medicine cabinets, etc.

6. Inspect installation to make sure insulating wool blankets are adequately attached and properly fitted.
7. Review appropriate system construction and application, and inspect for compliance with laminating recommendations and other construction procedures.

Face Layer

1. Verify material compliance.
2. Look for high quality workmanship. Cracked or damaged edge board should not be used. Wallboard surfaces should be free of defects; joints correctly butted and staggered.
3. Check proper application method—horizontal or vertical.
4. Examine fasteners for compliance with specifications, and measure the spacing of fasteners.
5. Review adhesive application method and see that recommendations and specifications are being followed.
6. Inspect trim at corners and around partition perimeter for secure attachment and proper installation.
7. Make sure that caulking is applied where required and completely seals the void.
8. Review back-blocking installation to be sure correct procedure is followed (see Chapter 3).

Fasteners

1. Make sure recommended or specified fasteners are used.
2. See that fasteners are applied starting in the center of the wallboard and working to the ends and edges.
3. Observe whether the board is held tightly against the framing. Test for loose board by pushing adjacent to the fastener. Check to see that the face paper is not broken when fastener is driven. If necessary, a second fastener should be driven within $1\frac{1}{2}$ " of the faulty one.
4. Examine fastener positions. Fasteners should be at least $\frac{3}{8}$ " in from edges and ends.

Adhesives

1. See that adhesive is applied only to clean, dry surfaces.
2. Make sure that board is erected within the allowable time limit after adhesive is applied so proper bond can be obtained.
3. Measure size of bead and spacing. Check for correct shape.
4. Observe impacting blows for proper spacing and positioning.
5. Make sure temporary fastening and shoring holds board tightly in place.
6. Review the appropriate adhesive application methods (Chapter 3) and inspect for compliance.

Joint Treatment

1. Make sure wallboard surface is ready for joint treatment. Fastener heads should be properly seated below wallboard surface. Protrusions should be sanded below level of surface. Cracks between panels should be filled with joint compound before taping.
2. See that recommended mixing directions are followed (see Chapter 3). Only clean water and mixing equipment should be used. DURABOND Joint Compound should not be held over or retempered.
3. Inspect joints and corners to see that the tape is properly embedded and covered promptly with a thin coat of joint compound. Only compounds suitable for embedding should be used. Heavy fills should be avoided.
4. Make sure that compound is used at its heaviest workable consistency and not over-thinned with water.
5. Check to see that joint compound is allowed to dry thoroughly between coats (see Drying Time Guide page 99). *Exception:* DURABOND Topping or Ready-Mixed finishing coats may be applied over DURABOND Joint Compound before it dries thoroughly.
6. Inspect second and third coats over joints for smoothness and for proper edge feathering. Only compatible compounds should be used over DURABOND compound.
7. Examine fastener heads and metal trim to see they are completely covered.
8. See that all finished joints are smooth and dry before decoration. Sand smooth if necessary.

Temperature

See that in cold weather, temperatures between 55° and 70°F are maintained both day and night. This temperature should be maintained 24 hours before, during and after the entire wallboard and joint treatment application (see Chapter 1).

Ventilation

Check for proper ventilation to provide drying of joint compound in about 24 hours. Avoid drafts during hot dry weather that cause too rapid drying of compound (see Chapter 1).

Special Applications

Review installation recommendations for special applications such as back-blocking, floating angle, predecorated board, SHEETROCK W/R wallboard, arches, sliding door lamination and radiant heat application and see that procedure is correct.



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CHAPTER

7

THE TOOLS YOU NEED

Suitably designed tools are of major importance in assuring a high quality of workmanship. The right tools for a particular job can result in improved efficiency and man-hour savings. In this section you will find tools specifically designed to meet the needs of the drywall contractor. In addition you will find information on tool construction, rental, purchase and application.

Through long experience it has been found that some tools may be easily and economically fabricated on the job. Construction details, instruction in use, and application of these tools also are included.

Where applicable, the original manufacturer is mentioned in the discussion of each tool. In addition a symbol is used to denote another source or sources of procurement. Here is the key to the symbols used throughout this section.

KEY TO SYMBOLS USED

* Wallboard Tool & Equipment Co.
1708 Seabright Ave.
Long Beach, Calif.

† Goldblatt Tool Company
1910 Walnut St.
Kansas City, Mo.

▲ Camco Supply Company, Inc.
5833 Outlook
Mission, Kas.

★ Available from *, †, ▲

†† Ames Taping Tools, Inc.
505 O'Neill Ave.
Belmont, Calif.

** Behr Manning Co.
Troy, N.Y.

(H) Available at hardware stores

(L) Available at lumber dealers

(P) Available at paint stores



Wallboard Application Tools

HANDLING

Foot Power Wallboard Lifter—This device is designed to move wallboard against the wall as it lifts. The tool is primarily used to raise the lower course of horizontally applied SHEETROCK Wallboard into nailing position. Vertically applied SHEETROCK may be raised in the same manner. The lifter is available from B. E. Gillespie, Box 446, Refugio, Texas. A similar tool is also available from Ames Taping Tools, Inc.



MEASURING

Steel Rule—King-size white face steel rule with Tru-Guide measuring aid and Tru-Cut tape-tip.★

Straight Edge—A calibrated metal straight edge and T-square used as a guide in making cuts across the full four-foot width of the wallboard. It eliminates the need for drawing lines, thus speeds accurate cutting. A metal edge is preferred because it prevents the knife from cutting into the edge as wallboard is scored.★



CUTTING

Trimming Knife—The Stanley Trimming Knife No. 199, with changeable blades, is used to score gypsum wallboard. It should be kept sharp to cut the paper cleanly and to score the core. The handle is taken apart to change blades. Spare blades are inside. Manufactured by Stanley Tool Co., New Britain, Conn.† (H)

Rasp—This tool is made on the job and is used to trim or smooth cut SHEETROCK ends or edges. It consists of a 2"x4" wood block with metal lath stapled to the face.



All-Round Circle Cutter—Cuts clean, sharp, round holes in gypsum wallboard up to 12" in diameter.★

Utility Saw★, Keyhole Saw (H)—Used for cutting small openings and making right-angle cuts in gypsum wallboard.

HAMMERS

The proper hammer for nailing SHEETROCK wallboard has round edges and a slightly crowned head which forms a "dimple" in the face of the board as the nail is "driven home." A hammer with a flat head and sharp edges will fracture the paper around the nail head and these cracks around the hammer head imprint may eventually appear through the decoration. The head of a lather's hatchet is too flat and its corners too sharp. A ball-peen hammer is too heavily crowned. A regular hammer head may be easily crowned with a file, if necessary. For driving nails in SHEETROCK Vinyl Wallboard, a plastic headed hammer, a rawhide mallet, or a regular hammer covered with pliable leather should be used to avoid chipping the enameled nail head.



16 oz. Crown Head—Carpenters' claw hammer with crown head will dimple wallboard properly. (H)

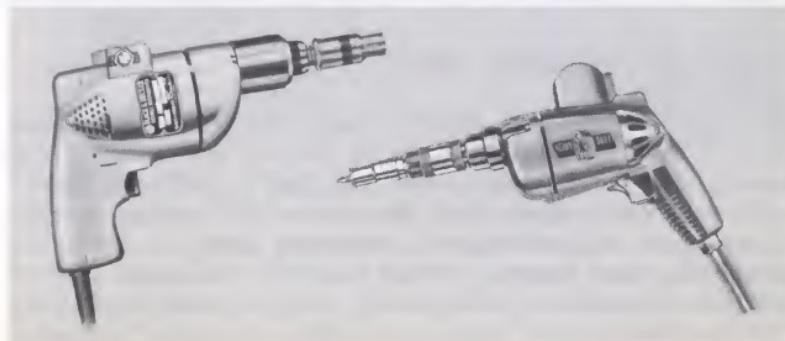
Plastic Headed Hammer—For driving special nails used with SHEETROCK Vinyl Wallboard and applying trim in SHEETROCK Demountable Partition. (H)

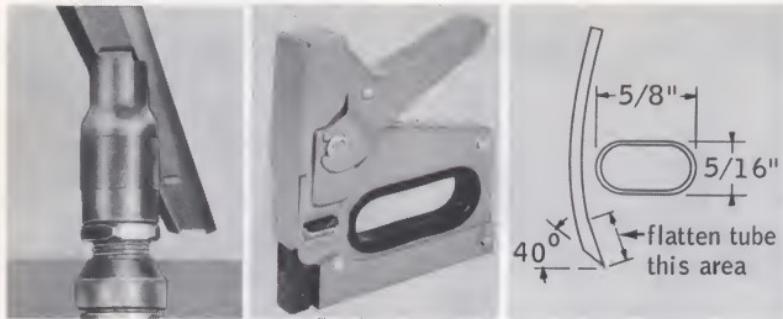
Wal-Board Hammer—Has a symmetrical convex face designed to compress wallboard and leave a perfect "dimple."★

Rubber Mallet—For impacting wallboard in adhesive nail-on method of application.

POWER-DRIVEN SCREWDRIVERS

The electric, power-driven screwdrivers shown here are the type used to drive USG Drywall Screws Types W, S, S-12, and G for attachment of gypsum wallboard to wood or metal framing or to gypsum core materials in laminated construction. These tools are designed to drive Phillips head steel screws to a preset depth below the wallboard surface, where the bit tip will be disengaged by a clutch mechanism. The magnetic bit tip holds the screw in position, ready to be driven. The tool may be set for various screw depths. Two models, heavy-duty and standard, are manufactured by Black & Decker Mfg. Co., Towson 4, Md. and Millers Falls Co., Greenfield, Mass. When ordering specify voltage desired: 115V or 220V AC/DC.

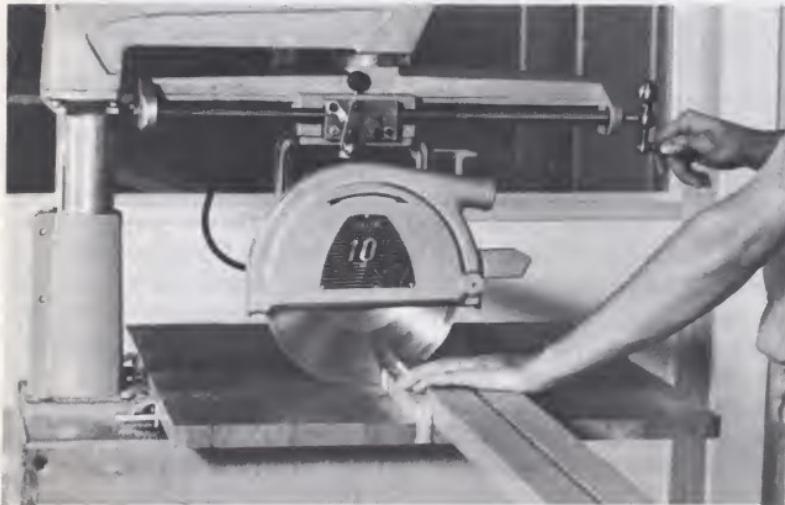




Finder—This accessory permits faster and neater screw attachment of aluminum battens in the SHEETROCK Demountable Partition. Part No. 52103, available from Black & Decker Mfg. Co., Towson, Md.

Pistol-Type Stapler—Used to attach base layer wallboard to wood studs and THERMAFIBER Insulating and Sound Attenuation Blankets. (H) (L)

Batten Insert Tool—Use to speed insertion of vinyl strip in batten on SHEETROCK Demountable Partitions. Cut from 6" length of $\frac{1}{2}$ " copper tubing; shape one end to a 50° angle and flatten tube to oval shape as shown. As vinyl strip feeds through, lip of tool provides flex in strip for easy insertion.



Metal Fabrication Tools

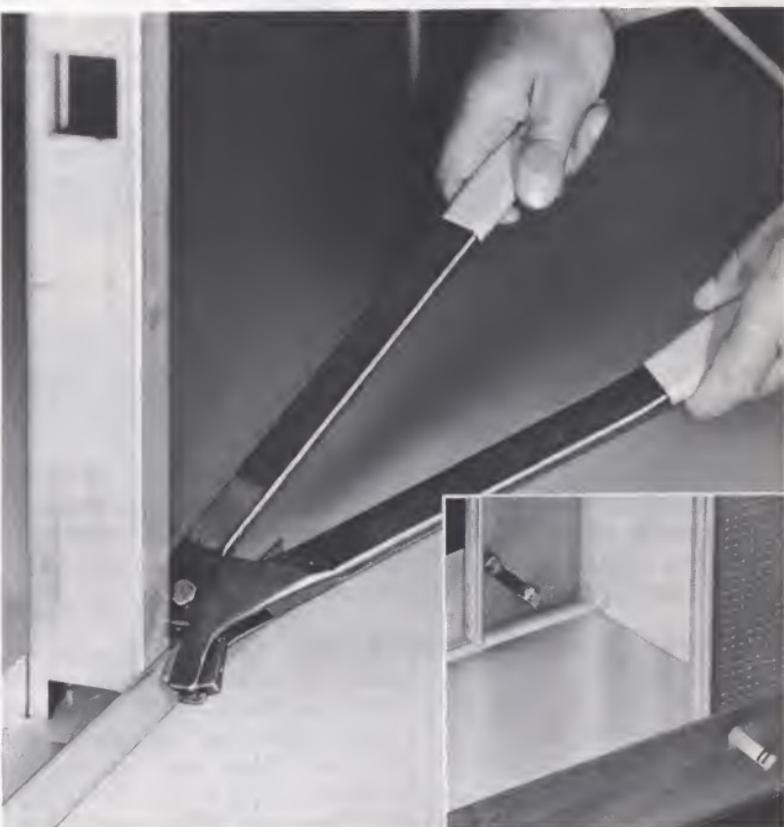
10" Radial Saw—An excellent unit for cutting aluminum SHEETROCK Demountable parts to size or for mitering and coping. Saw has movable 1-HP, 115/230 V, 3450 rpm motor with precision manual feed for fast, safe, accurate cutting. Components are held tightly to stationary table and stops, thus permitting more accurate cutting than with table type saws in which work is moved. Completely portable—unit weighs only 200 lbs. Easily moved from one location to another for on-the-

spot cutting. Available from Alum-Cut Saw Attachment Co., 401 N. Olive St., South Bend 28, Ind. Model: Delta Super 990 10" Radial Saw with Alum-Cut attachment.

Aluminum Cutting Saw Blade—A special aluminum cutting blade, 10" diameter, 100 teeth with $\frac{5}{8}$ " diameter arbor hole comes with above described saw. Also highly suitable is a non-ferrous metal cutting blade made of semi-hard high speed steel, 1/16" thick, hollow ground, 190 teeth, no set in teeth, manufactured by Simonds Saw & Steel Co., 3323 W. Addison St., Chicago, Ill.

Keep saw blades sharp for smooth clean cuts; use lubricant of automobile motor oil, water emulsified oil or kerosene.

Other manufacturers produce saws and saw blades satisfactory for sawing aluminum components. Before purchasing new equipment or adapting existing tools, contact reputable suppliers or manufacturers for their recommendations.



USG Metal Lock Fastener—Specially designed to rigidly attach metal studs to drywall runners and metal trim to drywall studs. This tool quickly pierces and folds over light gauge metal to form a positive, permanent lock. It insures a smooth stud face without fastener protrusions for flush wallboard attachment. Available from United States Gypsum.



Welding Gun—Automatically produces a perfect button weld on light metals by an arc welding process. The gun automatically attains proper welding heat, leaves a metal deposit with perfect penetration, controls the electrode burn-off length and stops the arc when the weld is completed. Used to secure metal studs to runners and steel door frames, also to splice studs. Models operate on 110-115V or 115-230V electricity. Manufactured by Marquette Manufacturing Co., 307 E. Hennepin Ave., Minneapolis 14, Minn.

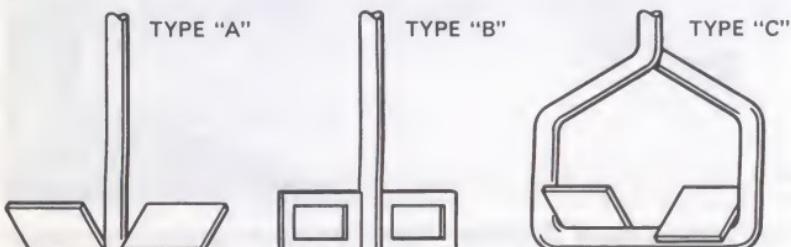
Hand Shear—Cuts holes for electrical and plumbing installations in metal studs. Quickly and easily driven with hammer blows. Available from Whitney Metal Tool Co., Rockford, Ill.

Joint Treatment Tools

MIXING EQUIPMENT

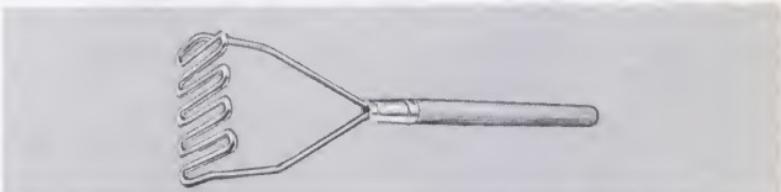
While hand mixing of **PERF-A-TAPE** and **DURABOND** Joint Compound is adequate, many applicators prefer electric mixers. Power mixing saves considerable time, particularly on large jobs where mixing in a central location is convenient.

Power is supplied by a $\frac{1}{2}$ " heavy duty electric drill operating on 115 volts AC-DC at not over 400 rpm. Drills operating at high speeds will whip air bubbles into the joint compound, rendering it unfit for finish coat purposes. If available at reasonable costs, drills of 200 to 300 rpm are even better.

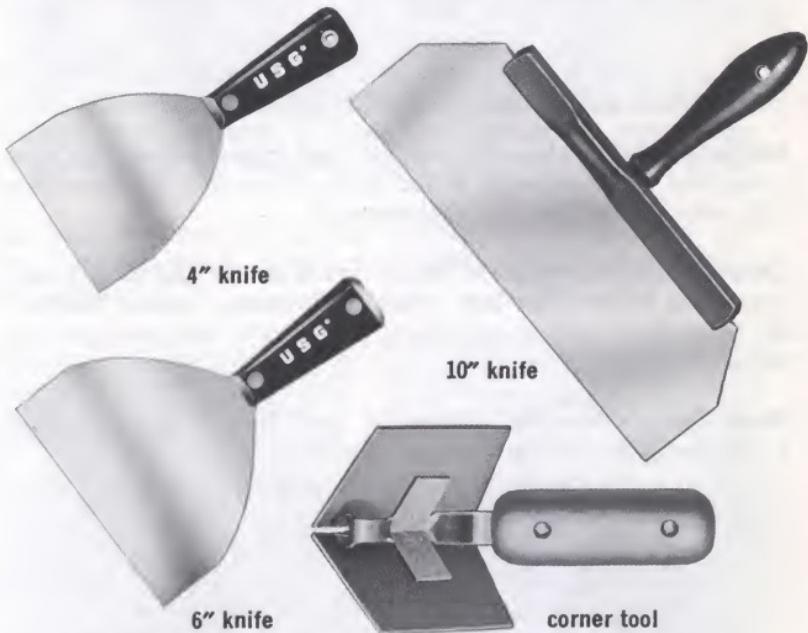


Mixing Paddles—Mixing paddles may be any one of the above types or variations thereof consisting of a $\frac{3}{8}$ " diameter shaft about 24" long to which blades are welded. Type "A" blades are approximately $1\frac{1}{4}'' \times 3''$ welded on at an angle of 45° .

Type "B" has three equally spaced blades approximately 2"x3½" welded in line with the shaft. Slots approximately 1"x2" are cut out of the blades to allow the compound to work through the blades in a folding action. Type "C" has blades approximately 2"x2" welded at a 45° angle on the bottom leg of a 4"x6" stirrup. Material for the blades is ¼" strap iron, for the shaft is ¾" round iron—both available at wrought iron fabricating shops.



Potato Masher—Used to hand mix joint cement. Available at restaurant supply companies or drywall accessory suppliers.††★

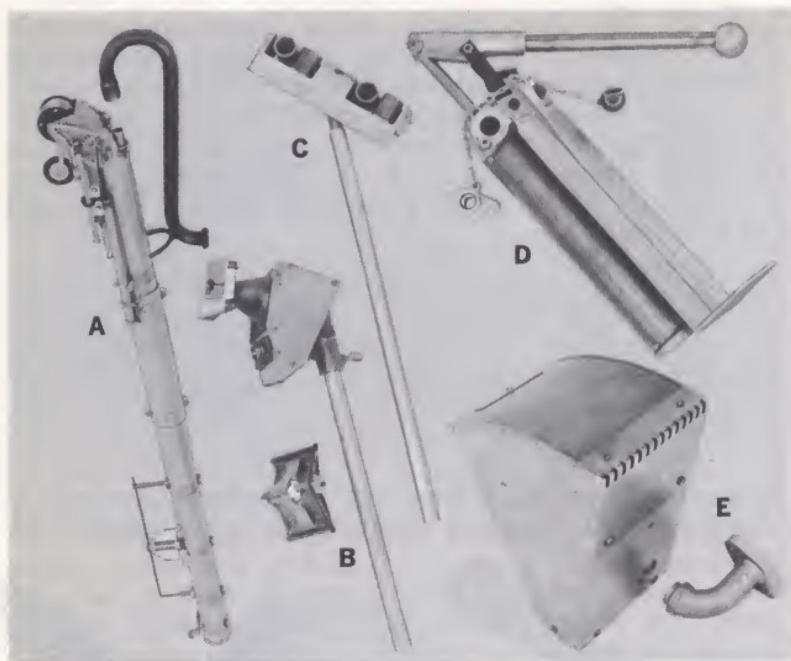


TAPE APPLICATORS

4", 5", & 6" USG Joint Finishing Knives—Dual purpose taping tools with squared corners. Professionally designed for flat work or to effectively work both sides of corner at one time. Available with either plain handle (as in 4" knife shown) or hammer head handle (as with 6" Knife). Also available in regular shaped, standard blade knives (not shown). Available from United States Gypsum.

10" USG Joint Finishing Knife, United States Gypsum—Plain handle only. (H) (L) (P)

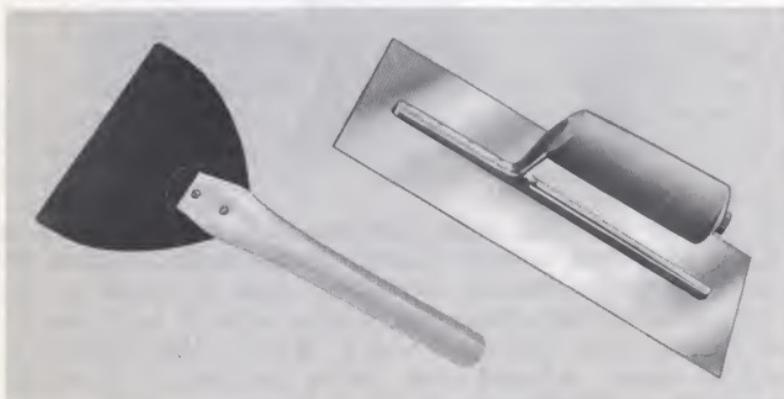
PERF-A-TAPE Corner Tool—Permits application of tape and joint compound to both sides of a corner at once. United States Gypsum. (H) (L) (P)



Automatic Taper (A)—Applies tape and proper amount of joint compound simultaneously to flat joints or corners. Designed for high volume machine tool application.††

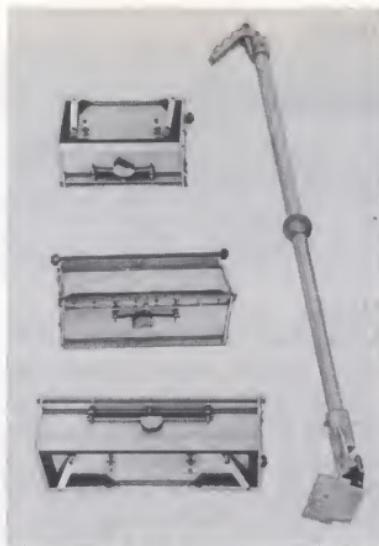
Corner Roller (B)—Used to imbed tape in corner and force excess compound from under tape prior to finishing. **Corner Finisher (C)**—distributes excess compound evenly over tape and feathers edges.

Hand Pump (D)—fills mechanical tools from 5-gal. pail. **Flat Applicator (E)**—finishes over fastener heads.††



Broad Knife—Used for wiping excess joint compound from taped joints. Available with regular or long handle; 7" or 9" replaceable blades.

11" Trowel—Used to apply joint compound in large areas or may be notched for use as a spreader tool. (H)



FINISHING TOOLS

7", 10", 12" Ames Finishing Tools—Used for application of successive coats of **PERF-A-TAPE** and **DURABOND** Joint Compound. Also used for mechanical tool application of **USG Cover Coat**.††

Pole Sander—Used for sanding ceilings and walls from the floor. Tool has a 48" handle, aluminum sanding block, and a universal joint.††



Pole Drywall Blade—Used for smoothing and finishing **USG Cover Coat** applications. Tool has 48" handle and replaceable spring steel blade 24" or 26" wide. Also known as Ames Acoustical Knife.††

Sling Psychrometer—Used to determine temperature and humidity for figuring joint compound drying time. Available from chemical supply firms.

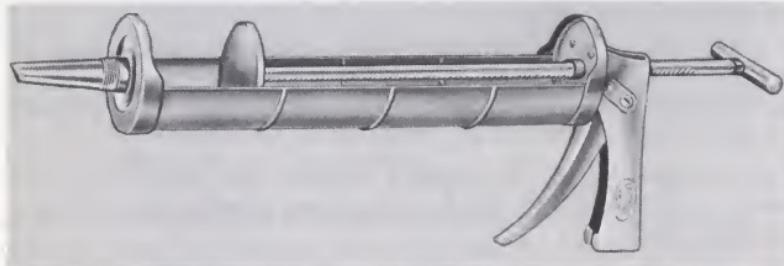
"Durite Screen-Bak" Sanding cloth—320 grit (fine) and 220 grit (medium). Used for sanding successive layers of **PERF-A-TAPE** and **DURABOND JOINT COMPOUND**.** (Not illustrated.)

Wallboard Lamination Tools



ADHESIVE NAIL-ON EQUIPMENT

Model A-3 Drywall Adhesive Applicator—This caulking-type gun has a trigger mechanism which stands rough usage and offers minimum resistance to a large bulk load of adhesive. Ratchet rod and precision construction aid in uniform application of adhesive. Barrel is 16" long and 3½" diameter with a quarter-turn or fully threaded breech cap. May be loaded using Alemite Loader Pump. Nozzle has a wedge-shaped nose with a ⅜" opening. Capacity of the gun is 2½" quarts and weight is approximately 8 lbs. Available from United States Gypsum.



Model A-2 Drywall Adhesive Gun—This cartridge type caulking gun is light in weight and easy to handle. The trigger mechanism's bearing is mounted to withstand rough usage and offers minimum resistance to a ¼-gal. cartridge of adhesive. The ⅜" ratchet rod is specially heat treated for long wear. Precision construction makes for even and steady application of adhesive. This applicator has a 1-qt. capacity. The reinforced cradle barrel is 13¼" x 2¾", provides a generous flow of adhesive. The gun nozzle has a ⅜" orifice and wedged nose. Weight about 3 lbs. Available from United States Gypsum.



Alemite Loader Pump, Model 7537—This device clamps on a 5-gal. can of SHEETROCK Brand Adhesive and is used to mechanically load the A-3 gun and Mastic Meter applicators. It eliminates the mess and waste of hand and paddle loading methods. When loading the A-3 gun, connect the gun to the pump with a standard galvanized pipe reducer bushing $\frac{1}{2}'' \times \frac{3}{8}''$ and a $\frac{3}{4}'' \times \frac{1}{2}''$ reducer coupling. (H) Loader pump is available from Alemite Company distributors. Shown at bottom left, opposite.

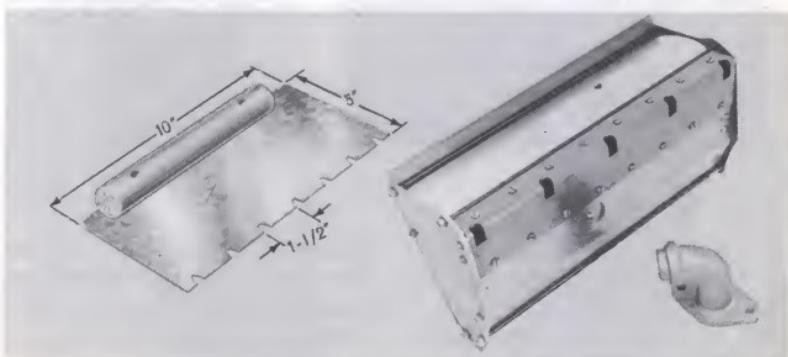
JOINT COMPOUND AND ADHESIVE SPREADERS

While there are a variety of manufactured spreaders available for use in wallboard lamination, it may be necessary to provide additional spreaders which can be made on the job. Stainless or galvanized sheet steel makes the best spreader. Spreaders made of other materials do not provide spreading action because joint compound tends to accumulate and dry in the notches. The metal spreader should have the approximate stiffness of a plaster trowel and be kept reasonably clean at all times. Apply a firm downward pressure on the spreader as it is drawn across the SHEETROCK surface.

SHEET AND STRIP LAMINATION

This spreader is generally used when back blocking walls and ceilings, laminating sliding door installations and applying double layer laminated SHEETROCK to wood or metal framing. Notches are spaced $1\frac{1}{2}''$ to $2''$ o.c. Each notch is $\frac{1}{2}''$ deep, $\frac{3}{8}''$ wide at the base with an inverted "V" shape. A piece of wood dowel, window stop, etc., provides a grip when attached near the edge of the blade.

For notch size and spacing of adhesive beads used in various partition systems, refer to the particular system description in Chapter 4.



Mastic Spreader—Used to apply adhesive in vertical strips to base layer gypsum boards or coreboard in strip laminated partition construction.††



Power-driven Applicator—For applying adhesive directly to wall surface on large jobs. This E-Z Laminator increases laminating production, saves labor and material and provides uniform adhesive bond. Available from P.D.C. Inc., 4001 S. Keeler Ave., Chicago 32, Ill.

Miscellaneous Tools

CAULKING EQUIPMENT

WALK-A-CALK Caulking Applicator—For use in applying caulk to seal under runners and around openings. Compound is pumped from a 5-gal. pail under air pressure through a nozzle at a constant rate of flow. Trigger cut-off. Requires 125 psi air compressor that delivers 5 cfm. Components manufactured by Stewart-Warner Corp. are assembled and sold by Alemite Co. dealers.



Caulking Loader—Model 4-A "Force-Flo" Caulking Loader for filling a USG Model A-3 Drywall Adhesive Applicator from a standard 5-gal. pail. Available from Force Flo, Inc., P.O. Box 2442, East Cleveland 12, Ohio.

MATERIALS HANDLING EQUIPMENT

The development of better systems with improved sound and fire resistance has opened a whole new opportunity for drywall in high-rise construction. Important to these applications is effi-

cient, low cost handling of wallboard at the job site. This includes elevating the materials to the required heights, unloading and distributing them damage-free to the point of use.

A large variety of equipment is available to do the job. Some may be rentable and some furnished by the general contractor. Job situations vary with each building. Thus, the following description is intended to give a basic understanding of terms and types of equipment used. Further consultation with suppliers for their recommendations should be undertaken before an expenditure is made. The USG Customer Service Department is also available to help contractors solve problems relating to materials handling equipment and methods.

Platform Hoist—A cantilevered platform lifting device. Manufactured by: Buck Equipment Co., 720 Anderson Ferry Rd., Cincinnati, Ohio; Champion Mfg. Co., 3700 Forest Park Ave., St. Louis, Mo.

Tubular Tower—A four poster, single or double-wall hoist. Manufactured by: American Tubular Elevator Co., Zelienople, Pa.; Beaver Advance Co., Elwood City, Pa.

Mobile Crane—A truck, crawler or railway-mounted crane. Manufactured by: Harnischfeger Corp., Milwaukee 46, Wisc.; Bucyrus-Erie, P.O. Box 1144, Milwaukee, Wisc.

Hand Pallet Truck—A manually operated lifting device which raises a load hydraulically and is used for distribution of material. Manufactured by: Raymond Corp., 159 Madison St., Green, N.Y. 13778; Wright-Hibbard Industrial Truck Co., 19th & West End Ave., Pottsville, Pa. 17901.

Sling—A device wrapped around a load or unit of material to enable a crane to lift the entire load. Manufactured by: Liftex Sling Inc., P.O. Box 368, Libertyville, Ill. 60068; Columbian Rope Co., 309 Genesee St., Auburn, N.Y.

Look-Out Platform—A portable braced platform or shelf extending from the building which supports material delivered by crane. Can be fabricated locally from steel I-beams or channels and lumber decking.

TOOL HOLDERS

Leather Tool Pouch—Holds nine wallboard application tools —big belt loop.★

Leather Nail Bag—Soft leather riveted for long life; round bottom designed so nails won't "pack"; big belt loop.★



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